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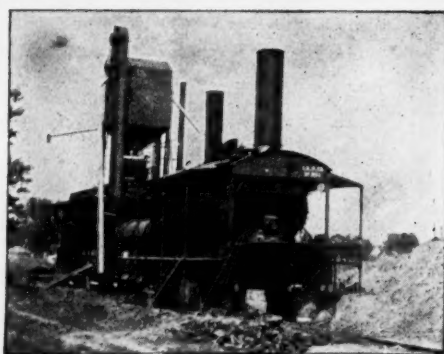
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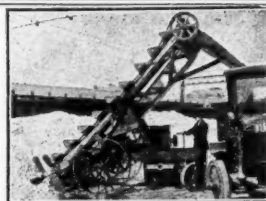
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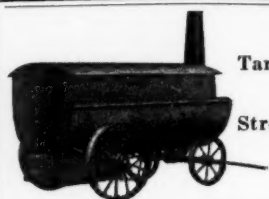


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# Municipal Journal & Public Works.

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articles or as letters discussing municipal matters, are invited and  
paid for.

City officials and civic organizations are particularly requested to  
send to Municipal Journal and Public Works regularly their annual  
and special reports.

## Information Bureau.

The Information Bureau, developed by twenty-one years' research  
and practical experience in its special field, is at the command of our  
subscribers at all times and without charge.

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## MUNICIPALITIES CAN LOWER FOOD PRICES.

The various cities of the country are offered an oppor-  
tunity by the War Department to purchase canned vege-  
tables and meats and sell the same to their citizens at  
prices which will be considerably below those being paid  
in most cities, and should thus be able to aid their citizens  
in meeting the ever increasing cost of living. The War  
Department has millions of dollars worth of canned corn,  
peas, baked beans, string beans and tomatoes, bacon in  
cans and crates, roast beef, corned beef and corned beef  
hash, which it will sell to cities in car-load lots at approx-  
imately the prices paid in the case of vegetables, and at  
about 80 per cent. of the cost to the government in the  
cases of canned and cured meats. The municipality must  
sell these goods to the public at the cost to it and payment  
for them may be deferred for a period of ten days after  
the goods have been actually received by the municipality.

To obtain these, address Surplus Property Officer at the  
nearest Zone Supply Office, which offices are located at  
Boston, New York, Philadelphia, Baltimore, Newport  
News, Atlanta, Chicago, St. Louis, New Orleans, Fort  
Sam Houston, El Paso, Omaha and San Francisco.

## CO-OPERATION IN PUBLIC SERVICE.

The employer who pays good wages but furnishes his  
employees with such poor tools that their output is but  
a fraction of what it should be soon loses money through  
a discouraged workman as well as because of inadequate  
tools. If in addition he should deliberately throw obsta-  
cles in the way of the work he would be considered foolish  
if not crazy.

But the taxpayers do just that. They employ men to  
clean the street and, for fear not enough of them will be  
put on the payroll, they throw papers, cigarette boxes,  
store sweepings and all kinds of rubbish into the roadway  
for the sweeper to remove, so that half his time may be  
spent on these. Or they place their garbage, ashes and  
refuse in a multitude of small receptacles that require  
time for emptying, or in leaky ones so that the escaping  
matter has to be swept and shoveled up, or in such large  
and heavy ones that the collector is permanently injured  
in handling them and is pensioned or becomes otherwise  
a public charge. (See page 37 of this issue.) And these  
men whose time the taxpayer thus wastes or whom he  
thus injures are his own employees, being paid with his  
own money.

The public should have continually put up to them the  
idea that public servants are their servants; that anything  
that makes public work cost more adds to their taxes;  
and that by co-operating with the public employees and

facilitating their work they are putting money in their own pockets. We believe that public officials could do much to aid in making the taxpayers realize this, and that they would at the same time make their own work easier and better appreciated.

### AN UNUSUAL WAR RECORD.

Few engineers can claim a war record equal to that of the president of the Illinois Society of Engineers, J. W. Dappert, of Taylorville, Ill. Mr. Dappert did not himself serve directly, but five sons served in the army in France and his daughter was in government service in Washington. One of the sons, Lieutenant J. Ivan Dappert, was killed in action near Albert, France; Lieut. John V. has been in a hospital since the armistice; Capt. Merlin L. and Lieut. Anselmo F. have just returned from France, and Sergeant Boyd H. is still in France.

This is a family record of which Mr. Dappert is deservedly proud; and we have no doubt that the family

will, as Mr. Dappert says he hopes to see them, "re-enter civil life with the same spirit they volunteered for army service." All are either practicing or students of civil engineering.

### TAR CONTAINERS.

We just timed three men using an hour of labor in stripping the iron container from a barrel of tar and cutting it into four pieces, to prepare it for heating for filling paving joints. The containers had no heads, and in the summer sun tar had run from such as were not standing plumb. Observation on this and other jobs leads us to estimate that on the average between five and ten per cent of the original contents of tar containers is lost in this way. Both losses could be saved by the adoption of some container that would prevent waste and at the same time facilitate getting the tar into the heater. It would seem as though American ingenuity should be equal to this.

## ASPHALT-COVERED NAPPED-BLOCK PAVEMENT

**A Pavement Being Laid in Newark, New Jersey, Replacing an Old Granite Block, Which Is Being Made Smooth by a Sand-Asphalt Surface—Long-Radius Corners and Sidewalk Replacing.**

The city of Newark, N. J., has under construction by contract, and more than half completed, a piece of pavement which is the first of its kind to be laid in that city, and so far as the engineers of the Department of Streets and Public Improvements are aware, has not previously been laid in exactly this form anywhere. The pavement is being constructed of old granite block napped and re-clipped and laid with a filler of sand and asphalt mixed, the novel feature consisting in the addition of a covering of the same sand-asphalt mixture over the entire pavement to a depth of about one-eighth of an inch, thus forming a thin asphalt pavement over the stone blocks. This work is being done under the direction of William A. Howell, engineer of streets and highways of Newark.

While old blocks which have been napped and re-clipped can be made into a smoother pavement than was the original one, it is not ordinarily so smooth as granite block pavements laid after modern specifications. It was in order to obtain a smooth pavement with this material that it was decided to cover it with the sand-asphalt coating. A part of the pavement has now been in service for about two weeks on one of the heavy-traffic streets of the city, and the department is very well satisfied with the service which it gives and promises to give.

The paving in question is being done on Clinton avenue from the West Newark branch of the Pennsylvania Railroad to the west side of Chadwick avenue, the contractor being the Newark Paving Company. This is a very busy thoroughfare which continues as a highway into a thickly populated section of the state of which Newark is the business center. Where this pavement is being laid there is a grade of about two to five per cent. A double street-car track runs through the center of the roadway and the street railway company is under obligation to provide for the paving in and between these tracks and for one foot beyond on each side. As is now commonly the case in paving city streets in which there are tracks, one-half of the street was entirely completed before the other half was torn up, thus leaving for the service of wheeled traffic one side of the street entirely free from obstruction.

The old pavement had been constructed with granite blocks about eight inches deep laid without any concrete

base. The new pavement consists of the same granite blocks taken up and broken or napped and dressed to give a flat top and reasonably close joints, with a depth of between five and five and a half inches, and laid on an eight-inch concrete foundation and a 1½-inch sand cushion. Reducing the depth from eight inches to five and a half inches reduces the total volume of granite used by about 35 per cent., and the waste from broken blocks and dressing amounts to little if any more than this; but to allow for any failure of the old granite to furnish sufficient blocks for the new pavement, it is provided in the contract that the contractors shall make up any deficiency by furnishing napped and re-clipped blocks obtained elsewhere.

The contract includes 4,300 square yards laid with the blocks already on the street, an estimate of 500 square yards in which the old blocks are furnished by the contractors, and a small section of 300 square yards adjacent to the P. R. R. tracks which are being laid with new granite blocks of standard modern specifications. The contractor bid \$3.42, using the old blocks napped and re-clipped, this including the removal of the old blocks and cutting them in shape for relaying, the grading of the subgrade, laying the eight-inch concrete base and relaying the blocks, including the surface of asphalt and sand. Where the same kind of pavement is laid using old blocks furnished by the contractor, the bid was \$4.72, and the bid for the pavement laid with new blocks in accordance with modern specifications was \$6.21. It is seen by these prices that the city pays \$2.79 less per square yard for the pavement laid with the old blocks napped and re-clipped than it does for a new granite pavement.

In connection with the matter of prices, it may be stated that, in the general specifications of the city for paving of various kinds, there are what are known as standing prices, which are the prices that are paid for work done by a contractor under any contract in which bids have not been received for this particular kind of work, the purpose being in general to provide for small items of special work, probably unforeseen, that may come up during the construction. On January 17, 1918, the commissioners increased by 20 per cent these standing prices, except that the increase was 50 per cent in the case of iron manhole and basin heads.

Bids on this contract were received April 1st and the contract was awarded April 17th to the Newark Paving

Company. Under the terms of the contract the work was to be completed in ninety working days from date of the filing of the contract. At the present time the entire length of one half of the street has been entirely completed, the blocks have been removed and napped for more than half of the other side of the street, the grading has been completed over about half of the uncompleted area and concrete base laid over perhaps one-third of it. The contractor furnishes a two-year guarantee, 5 per cent of his payment being retained, 2 per cent to be paid at the end of one year and 3 per cent at the end of the second year.

#### METHOD OF CONSTRUCTION.

In removing the old blocks, one man with a crowbar removes all of the blocks in each eighth course and loosens up the remainder by prying with the bar so that the stone can easily be picked up by hand. (There had originally been a tar filler between the blocks, but comparatively little of this remains and what there is has no adhesiveness.)

Following this loosening of the blocks, comes a gang of twelve men napping and clipping. These men seat themselves in a space made by lifting out a few of the loose blocks, using one block with a small cushion as a seat, and dress all the blocks near them from track to curb, moving ahead to a new position when all of the blocks up to the next stone dresser have been napped and clipped. In napping the blocks, a groove is cut quickly with hammer and chisel across the middle of one side of the block, extending between what were originally the top and bottom of the block; the block is then turned with this groove on the bottom and struck several blows on the other face directly opposite the chiseled groove, when the block breaks in two, providing two blocks with faces approximately at right angles to the original sides of the blocks. These new faces are used as the tops of two new blocks, and by means of the clipping hammer the head is shaped to an approximate rectangle.

The ends of the block are then broken off so as to give a depth of between five and five and a half inches. The specifications provide that the block shall be from three and a half to four and a half inches wide and the length not less than six inches. As the length of the new block corresponds to the depth of the old, and the latter was approximately eight inches, it is possible in most cases to obtain the six-inch length without difficulty. Where these dimensions cannot be obtained or the block breaks wrong, it is discarded. The broken pieces and chips are removed with the dirt in grading afterward to the subgrade.

Several of the dressers were timed and it was found that one man could nap and clip from five to seven new blocks in five minutes. Some of the men were apparently dressing 50 per cent more blocks than others, some averaging slightly less than five and others slightly more than seven. Allowing time for moving positions, etc., the men would apparently average about five hundred blocks a day per man.

Following the twelve stone dressers are two laborers who pile the dressed stone on the sidewalk. Following this, the subgrade is loosened by means of a rooter plow drawn by a team, and the earth is then shoveled into horse-drawn dump carts by eight laborers and a foreman. Grade for this, as for all operations, is obtained by stretching strings between the track and the curb and measuring down from the same. After the grading, the subgrade is rolled with a heavy Buffalo-pits road roller.

The base is mixed one cement, three sand and six of broken stone, a Koehring boom and bucket mixer being used. The sand and stone are piled on the finished subgrade ahead of the mixer and brought to it by wheelbarrow. The bucket holds about a half a batch and, while the writer was observing the work, the first bucket was filled after the batch had been mixed for about forty-five seconds and the second after mixing for about seventy-five seconds. About two to two and a half minutes were used for each batch. The grade of the top of the concrete is given by means of iron rods driven into the subgrade just ahead of the concrete at intervals, two such rods being spaced at uniform intervals between the track and the curb and the grade of the tops set by reference to a cord stretched between the top of the rail and the grade marked on the face of the curb. These steel rods are of course withdrawn after the concrete has been placed and surfaced.

The filler for the blocks is mixed approximately 50 per cent asphalt and 50 per cent sand. It is specified that the sand should all pass a 20-mesh screen and be heated to a temperature between 300 and 400 degrees Fahrenheit. (A Honhorst sand heater is used by this contractor for this purpose.) The asphalt cement is required to have a melting point between 130 degrees and 145 degrees Fahrenheit, at least 98½ per cent soluble in carbon tetrachloride, penetration between 60 and 100, ductility not less than 40 centimeters at the rate of five centimeters per minute, and lose not more than three per cent by volatilization when maintained at 325 degrees Fahrenheit for five hours. The material being used on this work is Texaco 65 paving cement. The filler must be applied over the entire area of each day's work before work is stopped for the night, the joints being protected by tarpaulin or other means in case work is interfered with by rain.

The asphalt and sand mixture is brought from the melting kettle to the streets in wheel-barrows and is poured into the joints by use of coal scuttles the nozzles of which have been flattened to a width of three or four inches. Sufficient surplus of the material is poured on the pavement to cover it about one-eighth of an inch thick and the whole area is then covered with a generous application of sand, a part of which is undoubtedly pressed into the asphalt by the traffic, which is at once allowed on the streets.

The stretch of this pavement which has been completed and in service for about two weeks gives almost as smooth riding as a sheet asphalt pavement—smoother, certainly, than a good granite block pavement constructed by modern specifications.

Before the laying of the pavement, the contractor removed the old curb and replaced it with granite curb. This new curbing, of which there were 2,200 lineal feet, is six inches wide on the top and twenty inches deep, the exposed face and top being four-cut and the curb being set in a bed of concrete twelve inches wide and six inches deep under the curb, at least six inches thick behind the curb and extending twelve inches up from the bottom of it. For this new curb the contractor receives \$1.67 per lineal foot, and \$1.97 for curb at the street corners which are laid to a radius of from ten feet to fifteen feet, depending upon the width of sidewalk.

In resetting the curbing, the sidewalk along the curb is of course more or less broken. (This being a business street, the sidewalk pavement is carried to the curb at all points.) The engineers pride themselves upon the prompt replacing of these sidewalks, the contractor being required to immediately replace the sidewalk as soon as

the curb has been set. The sidewalk is replaced with the same kind of material originally used, in some places cement and in others flagstone. The estimated amount of sidewalk to be replaced in this contract included 4,000 square feet of cement sidewalk five inches thick, the price for which was 21 cents; 1,000 square feet of bluestone flagging four feet wide, for which the price was 21 cents, including cement joints; 500 square feet of new bluestone flagging five feet wide at 24 cents; while it is estimated that 4,000 square feet of the old flagging can be relaid, the price for this relaying, with cement joints, being 5 cents a square foot. All of the sidewalk which has been destroyed by the replacing of curbing had been restored at the time of the writer's visit a few days ago.

Newark has for some time been employing a method

of treating old stone-block that suggests the asphalt surfacing just described. Many of these old pavements, laid without any concrete foundation, settle in small areas, frequently only two to a half-dozen blocks settling an inch or two. To remove these blocks and relay them is expensive, and removing the blocks without breaking any is difficult. In such cases the city, by its asphalt repair gang, fills in the depression level with the surrounding pavement with the same material used as the wearing surface for sheet asphalt pavements. A great many of these patches were seen and ridden over by the writer and seemed to be holding their place and surface well and to be quite satisfactory except for appearance. They are not a permanent construction, but keep a heavily traveled pavement passable until such time as a new one can be substituted for it.

## CURING CONCRETE

### Results of Tests Made to Determine Effect of Curing Conditions on Strength of Concrete and Wear from Abrasion—Results Much Better When Concrete Kept Damp for Several Days.

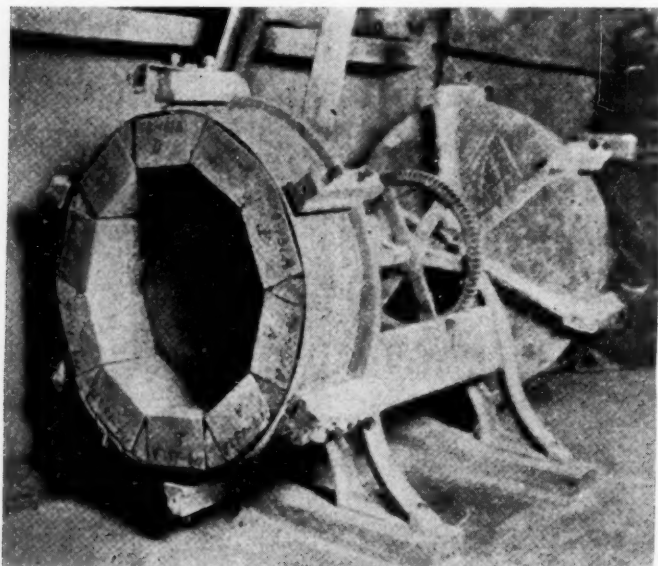
In the research laboratory conducted through the cooperation of Lewis Institute of Chicago and the Portland Cement Association, tests have been conducted during the past year or two on the effect which curing and the conditions under which the curing is effected have upon the strength and wear of concrete. These were conducted under the direction of Professor Duff A. Abrams, who described the tests and the conclusions therefrom in a paper before the American Railway Engineering Association.

Without going into details in describing the tests themselves, it may be said that the aggregates used in most cases were sand and pebbles, crushed limestone replacing the latter in one group of tests; the mixture being one volume of cement to four volumes of mixed aggregate. The concrete was mixed to six different consistencies as determined by the "slump" in a 6 x 12-inch cylinder upon removing the metal form. There were also four different conditions of curing, one set being stored in damp sand during the entire four months elapsing before testing, others being left in damp sand 21 days and in air 99 days, a third set being stored in damp sand for three days and air for 117 days, and the fourth being left in the air of the laboratory for the entire four months.

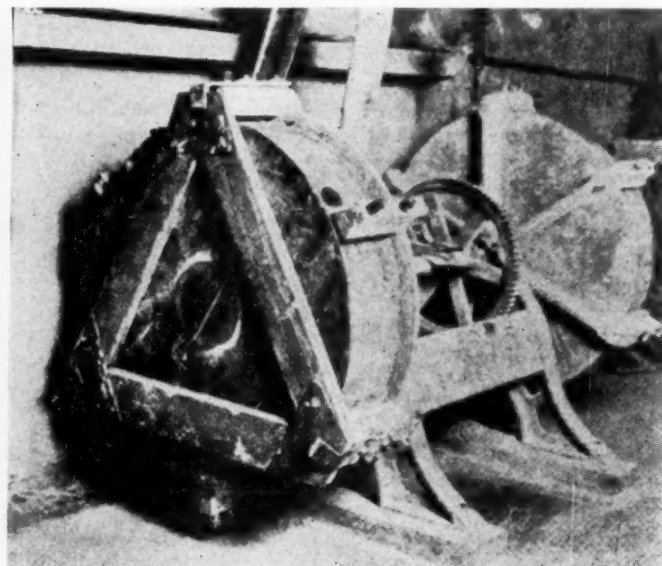
Pieces for compression tests were in the form of 6x12 cylinders and those for wear tests in blocks eight inches square and five inches thick. The compression tests were made in a 200,000 pound Olsen testing machine and the wear tests in a Talbot-Jones rattler.

In making the wear test, ten blocks were arranged around the perimeter of the drum and an abrasive charge used consisting of two hundred pounds of cast iron balls, ten being 3¾ inches in diameter and about 133 being 1½ inches. The rattler made 1,800 revolutions at the rate of 30 revolutions per minute, 900 revolutions being run in one direction and then 900 in the other. The loss in weight of each block during the test was considered the measure of its wear and was reduced to an equivalent depth of wear in inches.

While the Talbot-Jones rattler was designed many years ago, it has not been used to any wide extent, and the ordinary rattler of standard dimensions and construction has been almost universally employed for testing brick and other blocks employed in paving. Its use in these tests was considered to be entirely successful and the results have given those in charge of the laboratory considerable confidence in this method of testing. They consider that this rattler gives a wearing action



TALBOT-JONES RATTLER, BLOCKS IN PLACE.



RATTLER CLOSED, READY FOR TEST.

suited for a wide range in the properties of concrete. A very poor concrete may be entirely destroyed, while a high-grade concrete shows a wear of one-half inch or less. It gives a combination of abrasion and impact that cannot be withstood by an inferior concrete. While the test does not fully duplicate the action of traffic, it furnishes a valuable guide to the relative effects of different methods of treatment, materials, etc., for use in pavement construction.

This method of making wear tests of concrete is believed to have the following advantages as compared with other methods that have been used or proposed for this purpose:

- (1) The concrete is subjected to a treatment which approximates that of service.
- (2) The test piece is of usual form and of sufficient size that representative concrete can be obtained.
- (3) The test pieces are convenient to make, store and handle, and require a relatively small quantity of concrete.
- (4) The cost of tests is not excessive.
- (5) The machine used is found in a number of testing laboratories.
- (6) The wearing action takes place on the top or finished surface of the concrete. This makes it possible to study the effect of various surface treatments and finishes.
- (7) Several tests may be made at the same time, thus enabling more representative results to be obtained.
- (8) Tests may be made on sections of concrete cut from roads which have been in service.
- (9) Other paving materials, such as brick, granite blocks, etc., may be tested in the same manner as the concrete.

**Effect of Consistency.**—The consistency which gave a slump of between one-half inch and one inch was assumed to be normal, and the use of 90 per cent as much water was termed 90 per cent consistency, and the use of 50 per cent more water (which made a quite wet concrete) was called 1.50 consistency. With a consistency of 1.25, the strength was found to be about 75 per cent, and with a consistency of 1.50 the strength was only one-half of the maximum obtainable. With 90 per cent consistency the strength was slightly less in most cases than with normal consistency. However, in concrete road work where hand finishing is employed, the consistency must generally vary between 1.10 and 1.15 in order to secure a workable mix. If machine finishing is employed, however, the concrete can be mixed to a consistency corresponding closely to maximum strength.

In comparing blocks of different consistencies, the amount of wear was found to vary almost exactly inversely as the strength. The depth of wear at 1.00 consistency was found to be about .63 inch, while at a consistency of 1.50 the wear was about 1.20 inches.

**Effect of Curing Conditions.**—All consistencies of concrete showed a great increase in strength under favorable curing conditions as compared with specimens which were allowed to dry out at once. Even three days in damp sand increased the strength of the dryer concrete, while concrete stored for four months in damp sand was two and a half to three times as strong as similar concrete which had been exposed to room atmosphere for the same period. Protecting the concrete from drying out for only ten days increased the strength about 75 per cent.

As to the effect of curing on wear, the dryer mixes showed an increase in wear from 0.5 inch for concrete stored in damp sand for twenty-one days, to 1.1 inch for concrete in air for the entire period. For the wetter mixes, the wear of those that had been twenty-one days in damp sand was about 0.85 inch, of those that had been ten days in damp sand 1.15 inch, and after continuous air storage the wear was about two inches.

Blocks stored for the entire period of four months in damp sand showed more wear in most instances than

those which had been stored for twenty-one days in damp sand and the remainder of the time in air. This was believed to be due to the fact that in the former case the concrete was tested in a damp condition, it being a matter of common experience that non-metallic materials, such as timber, terra cotta, concrete, stone, etc., which absorb water show a lower strength in a wet condition than when dry. Additional tests will be required to show the effect of moisture content on strength and wear of concrete, other factors being the same.

The experiments indicated that a definite relation existed between strength and wear for different consistencies and curing conditions. Further tests will be necessary to show whether this relation is general for other aggregates when used in these tests. Prof. Abrams

2230

gives the formula,  $S = \frac{2230}{W^{1.07}}$ , in which S is the compres-

sive strength in pounds per square inch and W is the depth of wear in inches. An earlier series of tests, in which the samples were tested after two months, has given results from which were derived the formula

$$S = \frac{1800}{W^{1.3}}$$

The author says: "In view of the important influence of consistency and curing conditions of concrete shown by these tests, it seems doubtful if there is any phase of concrete work which will pay such high dividends as a little care to see that proper consistency is used and desirable curing conditions are provided."

## PUBLIC CO-OPERATION IN REFUSE COLLECTION.

### Duties and Responsibilities of Householdors Not Realized by Them—Should Separate Refuse and Provide Suitable Receptacles in Accessible Places.

In its report upon the refuse collection work done by the Department of Public Works of Rochester, N. Y., the Bureau of Municipal Research made many recommendations for improvements in the service rendered by the department; but in the concluding part of its report it says: "Perhaps the most important thing to accomplish is to obtain better and more intelligent co-operation between the public and the department. It is believed that as good service will be given as the public deserves and demands. To demand is not enough, however—the public must deserve good service by co-operating with the department in every possible way. Proper separation of refuse into the three desired classes and provision of adequate and more or less standard containers alone would do much to improve the quality of service possible to render; but the necessity for a mutual understanding of the entire problem is great. The duties and responsibilities of the department are fairly well known, but the public itself has duties and responsibilities fully as essential to satisfactory collection service which perhaps are not so well understood.

"The duties of the department are to remove refuse from the premises to the curb, to load it onto collection vehicles, and to transport it to the place of final disposition, all with as little nuisance and inconvenience as possible to the public. These duties imply:

- (1) That the work shall be done at convenient hours and with regularity and sufficient frequency;
- (2) That there shall be no destruction of property nor damage done to premises entered;

(3) That refuse shall not be scattered through the premises nor on the street;

(4) That the vehicles used in transportation shall not leak or otherwise result in nuisance;

(5) That the forces engaged in the work shall be courteous and as obliging as possible at all times.

"The duties and responsibilities of householders may be summarized briefly as follows:

(1) To provide suitable receptacles for all refuse;

(2) To separate all refuse carefully into the classes required by ordinance and necessary for its proper disposal;

(3) To store refuse in easily accessible places under sanitary conditions;

(4) To inform themselves of the requirements and to observe carefully all ordinances relating to the separation, storage and collection of refuse;

(5) To co-operate sympathetically with the collection forces by recognizing the difficulties under which the work is done, by confining complaints to legitimate causes, and by making intelligent suggestions toward the improvement of conditions and work methods.

"In all frankness it must be stated that the department comes much nearer to fulfilling its obligations to the public than the public does to conforming to the requirements made of it."

A general investigation or canvass was made of the ash receptacles used throughout the city, and 96,971 such receptacles were noted on the lists. Of this number, 34.1 per cent were galvanized iron cans, 21.25 per cent were sugar and salt barrels, 13.8 per cent were flour and apple barrels, 7.63 per cent were wash tubs, 5.9 per cent were egg crates, soap boxes, etc., 4 per cent were bushel baskets, and the remainder comprised fish barrels, large packing boxes, 50-gallon casks cut in two, butter tubs, pails and buckets with handles, wash boilers, market baskets and other miscellaneous receptacles.

Some of these receptacles were so dilapidated that their contents could not be emptied into the wagon without spilling, others were so large that their weight made it impossible to empty them and their contents were dumped on the streets and shoveled into the wagon. It was shown by timing that it cost five times as much to shovel a can of refuse from the ground as to dump it into the wagon. A greater part of the barrels were minus hoops and even parts of the sides and bottoms. A number of calcium chloride cans had dangerously sharp edges along their tops by which the hands of many of the collectors were cut and torn. The only receptacles that could be considered proper were the 34 per cent of galvanized iron cans, and most of these were found in public schools, fire houses and other public buildings, in the down-town business district where they are required by law, and on a few streets in the better residential sec-

tions. All of the other receptacles are difficult to handle, causing loss of time of the collectors and unjustifiable tax upon their strength and spilling of the dirt upon the street so that it is impossible to avoid littering the street in emptying them, while many of the smaller ones were found already heaped up and overflowing, with their intended contents already scattered about over a considerable area.

Answering the argument that might be offered that the furnishing of proper receptacles for ashes and rubbish would add more to the expense of the householders than would be saved in the collection service, the report states that this is not the case, but that proper receptacles if taken care of would last several seasons and their cost per year to the householder would be very small, whereas the amount which their use adds to his taxes in order to cover delay in collection and added work for the street cleaners is a very appreciable item. Not the least objection to the indiscriminate use of all kinds of containers is the fire hazard. The use of these miscellaneous wooden receptacles for ashes has been proved to be the cause of fires in many cases and probably has been the cause of others, many of them serious.

In addition to furnishing these improper receptacles, the householders add to the difficulty and delay of collection by failing to shovel snow from the walks leading to the points where the receptacles are stored. This makes it difficult and sometimes almost impossible to truck or otherwise remove to the collecting wagon, through a foot or more of snow, barrels of ashes weighing from one to three hundred pounds.

Another source of additional expense is the failure of the householder to put out the ash or rubbish receptacle before the collecting wagon arrives, and his calling up the office complaining that the material had not been collected and demanding that a wagon be sent for it. It was admitted that in Rochester a part of this was undoubtedly due to the failure of the department to make and observe a regular schedule of times for calling for ashes and rubbish.

Another way in which the public interfered with the operation of collection was the placing of receptacles where they would be buried in snow or frozen in ice so that it was impossible for the collectors to remove them.

Complaint was made that many householders, and especially the proprietors of hotels and restaurants, give their garbage to private collectors, in direct violation of the law. These private collectors take only the best and fattest garbage, leaving the low-grade garbage for the city to collect. In 1917 it was estimated that fully 40 per cent of the garbage was collected by these private scavengers. Whether the garbage is used for hog feeding or in a reduction plant, this practice means a loss of revenue to the city; and whether the garbage is utilized or



FIFTY-GALLON CASKS FILLED TO THE TOP WITH GARBAGE, WHICH ONE MAN HAS TO EMPTY.



DAMAGED AND UNSUITABLE RECEPTACLES MAKE THE WORK OF THE COLLECTORS DIFFICULT.

not, a nuisance is almost sure to be created by the use by the private collectors of leaky tanks or wagons and other careless appliances and methods in making the collections.

Another point considered in the report, while it does not directly affect the collection of refuse, is an important one from the viewpoint of the public good, this being the objection to allowing rubbish to accumulate on premises because of the fire danger with certain classes of rubbish, odors and other unsanitary conditions occasioned by other classes, and the general public nuisance occasioned by the unsightly yards and vacant lots that result from such accumulation.

It is recommended that the following procedure be followed in an effort to bring about a better understanding by the public of the problem of refuse collection and its co-operation with the collectors.

(1) All laws, ordinances and rules relating to the separation, storage, collection and disposal of refuse and to the work of street and sidewalk cleaning should be revised and combined in a sanitary code. This code should be printed and distributed among all householders and property owners as well as members of the sanitary forces, the police and other interested persons.

(2) A section should be added to this code to include definitions of all terms and a complete classification of refuse.

(3) Provision should be made for enforcing the provisions of the sanitary code. For this purpose it is believed all officers of the proposed Bureau of Sanitation should be empowered by law to issue warnings and to serve summonses for violations of the code.

(4) A comprehensive campaign for the education of the public as to its duties, responsibilities and rights, and as to the reasons for each, should be undertaken. This is essential, since without hearty public co-operation existing undesirable conditions cannot be corrected. It means, in effect, that the department must take the public into its confidence and explain the motive back of its regulations. To accomplish the desired result all available means of publicity should be used, including newspapers, schools, local welfare and improvement societies, etc.

"Good municipal housekeeping and civic cleanliness demand that the safety, welfare and convenience of the many shall not be impaired by the carelessness or slovenliness of the few. There is no reason why the majority should be inconvenienced and even the general safety of the whole city endangered by a few persons. If such offenders do not have any sense of civic pride or cleanliness, they should be required to maintain a proper observance of the laws of decency and regard for the rights of others." Ordinarily there are ordinances calculated to secure the observance by all citizens of the regulations relative to refuse collection; and the department should enlist the influence of the majority in requiring the officials to enforce the rules.

### TYPHOID AND WATER DISINFECTION IN MARYLAND.

#### Effect of Use of Chlorine in Eighteen Supplies, as Indicated by Typhoid Cases and Deaths Before and After.

In the issue of June 7th we published a discussion, by Robert B. Morse and Harry R. Hall, chief engineer and assistant engineer respectively of the Maryland Department of Health, of the use of chlorine in disinfecting the public water supplies of that state. In the following issue we published tabulated data showing the typhoid death rates in 82 cities of the country for a few years before and after the use of chlorine was begun. Through an oversight we omitted from this tabulation data concerning Maryland municipalities which had been furnished by Mr. Morse but had been mislaid in handling the hundreds of returns that were then passing through this office. This information is given herewith both in the form prepared by Mr. Morse and rearranged to correspond with the tabulation in the June 14th issue.

Typhoid Fever Cases and Deaths in Towns in Maryland Having Disinfection Plants.

Name of City	1910	1911	1912	1913	1914	1915	1916	1917	1918										
Annapolis .....	14	9	12	12	12	*17	6	8	2	Luke .....	0	1	0	3	5	18	3	5	*3
Baltimore .....	1,891	1,201	1,083	1,163	757	*949	806	566	322	Princess Anne ..	2	0	1	1	1	2	1	0	0
Braddock Hghts..	235	154	136	135	130	122	104	92	74	Rockville .....	8	1	2	5	10	4	17	*2	7
Cumberland .....	0	0	0	0	0	1	0	0	*0	Salisbury .....	0	3	1	0	0	0	2	0	1
Elkton .....	0	4	1	0	0	1	0	0	0	Takoma Park ...	18	9	3	3	†34	1	*3	2	0
Frederick .....	567	308	190	*450	68	76	57	50	12	Union Bridge ...	0	0	0	1	1	0	0	0	0
Frostburg .....	35	23	17	37	17	9	14	8	3	Westminster ....	77	81	22	53	41	46	45	*27	13
Hagerstown .....	21	14	23	10	5	11	7	*7	3										
Kensington .....	2	3	7	1	0	3	2	2	0										
Laurel .....	39	60	53	22	*14	20	16	8											
	8	6	5	7	3	0	6	1	0										
	10	42	17	6	3	10	*12	7	1										
	3	5	2	1	3	1	2	0	0										
	44	41	38	*112	*32	108	53	55	26										
	3	4	6	4	4	12	6	14	0										
	0	2	0	0	0	1	1	0	*0										
	0	0	0	0	0	0	0	0	0										
	12	12	6	10	8	*7	6	4	4										
	0	1	0	0	2	0	0	0	0										

Note.—Upper figures give cases, lower deaths. Star (\*) indicates year disinfection plant was installed. Dagger (†) indicates temporary hypo. plant installed.

Use of Chlorine for Water Supplies in Maryland Municipalities.

City	Population		Began use of chlorine	Other treatment	Deaths from Typhoid										
	1910	1918			Years Before Use of Chlorine			Years After Use of Chlorine							
Annapolis		8,677	1915	None	5	4	3	2	1	1	2	0	3	4	5
Baltimore		599,650	1915	Filtration	235	154	136	135	130	104	92	74			
Braddock Heights		175	1918	None	0	0	0	0	0						
Cumberland		26,074	1913	Filtration			35	23	17	17	9	14	8		
Elkton		2,442	1917	None	7	1	0	3	2	0					
Frederick		11,340	1915	None	8	6	5	7	3	6	1	0			
Frostburg		6,655	1916	None	5	2	1	3	1	0	0				
Hagerstown		27,000	1914	None			3	4	6	12	6	14	0		
Kensington		865	1918	None	0	0	0	0	0						
Laurel		2,692	1915	Filtration	0	1	0	0	2	0	0	0			
Luke		950	1918	Filtration	1	1	2	1	0						
Princess Anne		1,133	1917	None	1	0	0	0	2	1					
Rockville		1,239	1914	None		0	0	0	1	0	0	0	0		
Salisbury		8,696	1917	None	10	10	4	3	12	0					
Takoma Park		1,646	1918	Filtration	1	0	0	0	0						
Union Bridge		918	1914	None		1	0	1	1	0	0	0	0		
Westernport		3,288	1914	None		0	0	0	2	4	0	1	0		
Westminster		3,374	1918	Filtration	1	1	1	0	0						

## WATER RATES AND FIRE PROTECTION CHARGES

**Data from Several Hundred Cities of the United States—Maximum and Minimum Rates—Changes Since Before the War—Receipts for Public Hydrants and Private Fire Protection.**

In connection with the information concerning water works matters which was published in our issue of June 7, we obtained through questionnaires information concerning the rates charged by the several cities for water sold by meter, the amounts of consumption limiting the maximum and minimum rates, changes in rates caused by war conditions, fire hydrant rentals, and charges for

private hydrants and sprinklers used for fire protection. The tabulation of these data occupied so much space that we could not find room for it in that issue, and are giving the first installment in this issue, others to follow in succession.

The rates are based on the hundred cubic feet in some cities and the thousand gallons in others; the former

### METER RATES AND FIRE PROTECTION.

City and State.	Municipal or Private.	Maximum Meter Rates.		Minimum Meter Rates.
		Rate.	For consumption less than	
<b>Alabama:</b>				
Gadsden .....	Municipal	25c. per 100 cu. ft.		4c. per 100 cu. ft.
Talladega .....	Municipal	25c. per M	5,001 gals.	6c. per 1,000 gal.
<b>Arizona:</b>				
Clifton .....	Private	\$1 per M	1,000 gals.	13½c. per M
<b>Arkansas:</b>				
Fayetteville .....	Municipal	\$1 per M	.....	35c. per M
<b>California:</b>				
Alhambra .....	Municipal	\$1 per 100 cu. ft.	800 cu. ft.	5c. per 100 cu. ft.
Anaheim .....	Municipal	\$1	7,500 gals.	10c. per 750 gal.
Lodi .....		15c. per M	.....	5c. per M
Los Angeles .....	Municipal	7c. per 100 cu. ft.	10,000 cu. ft.	5c. per 100 cu. ft.
Oxnard .....	Municipal	20c. per 100 cu. ft.	501 cu. ft.	7c. per 100 cu. ft.
Palo Alto .....	Municipal	12c. per M	.....	12c. per M
Pasadena .....	Municipal	10c. per 100 cu. ft.	1,001 cu. ft.	8c. per 100 cu. ft.
Riverside .....	Municipal	30c. per 100 cu. ft.	301 cu. ft.	6c. per 100 cu. ft.
Sacramento .....	Municipal	.....	.....	.....
San Diego .....	Municipal	\$1.00 per 100 cu. ft.	.....	8c. per 100 cu. ft.
Santa Maria .....	Municipal	30c. per M	5,001 gals.	8c. per M
South Pasadena .....	Private systems	9½c. per 100 cu. ft.	1,301 cu. ft.	7c. per 100 cu. ft.
Stockton .....	Private	10c. per 100 cu. ft.	1,001 cu. ft.	7c. per 100 cu. ft.
		25c.	10,000 cu. ft.	10c.
<b>Colorado:</b>				
Colorado Springs .....	Municipal	15c. per M	10,000 gals.	8c. per M
Fort Morgan .....	Municipal	25c. per M	5,001 gals.	5c. per M
Greeley .....	Municipal	15c. per M	1,901 gals.	7c. per M
Rocky Ford .....	.....	\$1.50 per M	500 gals.	10c. per M
<b>District of Columbia:</b>				
Washington .....	Municipal	\$4.50 per year	7,501 cu. ft.	4c. per 100 cu. ft.
<b>Connecticut:</b>				
Ansonia .....	Private	18c. per 100 cu. ft.	10,000 cu. ft.	4c. per 100 cu. ft.
East Hartford .....	Municipal	30c.	500	15c.
Hartford .....	Municipal	16c. per M	22,000 gals.	8c. per M
Middletown .....	Municipal	12c. per 100 cu. ft.	20,000 cu. ft.	5c. per cu. ft.
Putnam .....	Municipal	20c. per M	1,001 gals.	10c. per M
Southington .....	Municipal	25c. per 100 cu. ft.	1,001 cu. ft.	4c. per 100 cu. ft.
South Norwalk .....	Municipal	(d)	.....	.....
Suffield .....	Private	35c. per 100 cu. ft.	25,000 cu. ft.	\$2.50 per quarter
South Manchester .....	Private	20c. per 100 cu. ft.	10,000 cu. ft.	10c. per 100 cu. ft.
Wallingford .....	Municipal	20c. per M	15,000 cu. ft.	4½c. per M
Willimantic .....	Municipal	25c.	14,196	.....
<b>Florida:</b>				
De Land .....	Municipal	\$4 per quarter	10,001	.....
Fort Myers .....	Municipal	33½c. per M	3,001 gals.	15c. per M
Miami .....	Private	16c. per 100 cu. ft.	9,000 cu. ft.	6c. per 100 cu. ft.
Ocala .....	Municipal	12½c. per 100 cu. ft.	.....	\$1.25 per month
St. Augustine .....	Municipal	\$3	270,000 cu. ft.	Sliding scale per 100 cu. ft.
St. Petersburg .....	Municipal	18c. per M	.....	12c. per M for sprinkling lawn (separate meter)
<b>Georgia:</b>				
Albany .....	Municipal	20c. per cu. ft.	30,000 cu. ft.	10c. per cu. ft.
Americus .....	Municipal	20c. per M	Domestic	15c. per M
Atlanta .....	Municipal	12c. per M	6,001 gals. per month	8.4c. per M
Commerce .....	Municipal	25c. per M	25,000 gals.	10c.
Elberton .....	Municipal	20c. per M	5,000 gals.	.....
Fitzgerald .....	Municipal	30c. per M	10,000 gals.	15c. per M
La Grange .....	Municipal	30c.	3,301	10c.
Marietta .....	Municipal	21c. per M	10,000 gals.	13.13c. per M
Savannah .....	Municipal	9c. per 100 cu. ft.	10,001 cu. ft.	4½c. per 100 cu. ft.
Tifton .....	Municipal	60c. per M	2,000 gals.	7c. per M
<b>Idaho:</b>				
Coeur d'Alene .....	Private	40c. per M	5,000	10c. per M
Lewiston .....	Municipal	17c. per 100 cu. ft.	701 cu. ft.	6c. per 100 cu. ft.
Twin Falls .....	Municipal	.....	.....	\$1
<b>Illinois:</b>				
Cairo .....	Private	27 net	10,000	6.3 net
Canton .....	Municipal	40c. per M	1,001	32c. per M
Champaign & Urbana...	Private	25c. + 15%	5,000 per quarter	12.5c. + 15%
Chicago .....	Municipal	6.25c. per 100 cu. ft.	1,001 cu. ft.	.....
Chicago Heights .....	Municipal	18c.	1,301 cu. ft.	5c.
De Kalb .....	Municipal	40c. per M	5,001	10c. per M
Downer's Grove .....	Municipal	50c. per M	2,501	14c. per M
Duquoin .....	Private	25c.	1,001	7c.
Kankakee .....	Private	31c. per M monthly	12,001	13c. per M
Lincoln .....	.....	.....	.....	.....
Mattoon .....	Municipal	40c.	4,500	6c.
Mount Carmel .....	Private	25c.	100,000	10c.
Mount Vernon .....	Private	30c. per M	10,000	7c. per M
Olney .....	Municipal	29c. per M monthly	2,410	12c. per M
Paris .....	Municipal	25c. per M quarterly	30,001	6c. per M
Peru .....	Municipal	25c. per M	18,000	\$3 per year
Princeton .....	Municipal	\$1 per 100 cu. ft.	51 cu. ft.	25c. per 100 cu. ft.
Quincy .....	Municipal	.....	.....	.....
Streator .....	.....	16c. per 100 cu. ft.	.....	7c. per 100 cu. ft.
Watseka .....	.....	25c. per M	100,000	.....

(To be continued)

## METER RATES AND FIRE PROTECTION.

City and State.	Minimum Meter Rates For consumption more than	Increase since before the war.	City pays for fire hydrants.	Charge for private hydrants or sprinklers.
<b>Alabama:</b>				
Gadsden .....	115,000 gals.	None	\$40 each per year	Have none
Talladega .....		None	\$7.92 each per quarter	\$9 per hydrant, allowance free, 18,000 gal.
<b>Arizona:</b>				
Clifton .....	100,000 gals.	None	\$2.50 per month	\$2.50 per month
<b>Arkansas:</b>				
Fayetteville .....		20%	None	None
<b>California:</b>				
Alhambra .....	For irrigation	None; fire hydrant rental proposed	\$1.50 each per month	Fire hydrants \$1.50; sprinklers \$1 each inch diameter of pipe Water through meter
Anaheim .....	7,500 gals.	None	\$5 each	None
Lodi .....		None	\$6 per year	None
Los Angeles .....	50,000 cu. ft.	None	Nothing	\$1-2", \$1.50-3", \$2-4", \$4-6"
Oxnard .....	11,000 cu. ft.	None	Nothing	None
Palo Alto .....		None	\$1.50 each per month	None
Pasadena .....	1,000 cu. ft.	None	75c. each on 8" mains or larger	\$1 per month if separate from domestic service
Riverside .....	3,000 cu. ft.	None	\$500 per month	\$1 per month
Sacramento .....		None	Nothing	\$5 for sprinklers
San Diego .....		None	Nothing	\$1 per month
Santa Maria .....	25,000 gals.	Have reduced	\$12 each per year	None
South Pasadena .....	1,300 cu. ft.		25c. each per month	
Stockton .....	1,000 cu. ft. 50,000	None	\$1 per month; city owns hydrants	Sprinkler systems metered
<b>Colorado:</b>				
Colorado Springs .....	50,000 gals.	None	Nothing	None
Fort Morgan .....	100,000 gals.	None	\$40	\$8 for sprinklers per season
Greeley .....	100,000 gals.	None	\$40 each	None
Rocky Ford .....	10,000 gals.	None	Nothing	None
<b>District of Columbia:</b>				
Washington .....	7,500 cu. ft.	None	Nothing	None
<b>Connecticut:</b>				
Ansonia .....	400,000 cu. ft.	Minimum rate raised from 3c. to 4c. per 100 cu. ft.	\$25 each per year	(a)
East Hartford .....	5,000	None	\$30 to \$150 per year	\$30 to \$150 per year
Hartford .....	22,000 gals.	None	\$3.50 each for upkeep	None
Middletown .....	150,000 cu. ft.	None		Based on insurance value of property
Putnam .....	20,000 gals.	None	City pays for all water used	Hydrants \$30 per year; sprinklers \$1 per 1,000 sq. ft.
Southington .....	100,000 cu. ft.	Minimum rate too low, should be raised	\$18 per hydrant	\$18 per hydrant; \$1 each for sprinklers
South Norwalk .....		None	Nothing	None
Suffield .....		None	\$30 per year	\$30
South Manchester .....	10,000 cu. ft.	None	No charge	Installed at expense of protected party—no rental
Wallingford .....	800,000 cu. ft.	None	No charge	None, providing factory pays reasonable rate
Willimantic .....		None	No charge	None
<b>Florida:</b>				
De Land .....		\$1 per quarter		Regular rates
Fort Myers .....	11,000 gals.	None	Nothing	None
Miami .....	540,000 cu. ft.	None	Nothing	\$25 per year
Ocala .....		25%	\$30 each	12½c. per 100 cu. ft.
St. Augustine .....	270,000 cu. ft.	None	Credit 145 @ \$45 per year	None
St. Petersburg .....		10% decrease	Nothing	None
<b>Georgia:</b>				
Albany .....	30,000 cu. ft.	None	Nothing	None
Americus .....	Manufacturers	2 consumers from 11½c. to 15c.	\$40 each per year credit	\$10 inside, \$25 outside hydrants; no charge for sprinkler system
Atlanta .....	75,000 gals. per month	20%	\$25 each per year credit	\$1 for 3" connections, \$1.50 for 4", \$2 for 6", \$3 for 8", collected monthly
Commerce .....	100,000 gals.	None, but proposed		Furnished free to exclusive users of city water
Elberton .....		None	Nothing	None
Fitzgerald .....	75,000 gals.	Minimum 33½%	Nothing	None
La Grange .....	1,000,000 gals.	20%	\$30 per month credit	Hydrants \$30 per year
Marietta .....	100,000 gals.	None	Nothing	None
Savannah .....	100,000 gals.	None		\$16 for 2", \$24 for 3", \$32 for 4", \$48 for 6" & 8"
Tifton .....	1,000,000 gals.	20%	Nothing	None
<b>Idaho:</b>				
Coeur d'Alene .....	1,100,000	None	Free to city	\$5 per month for hydrants
Lewiston .....	31,300 cu. ft.	None, but might decrease	\$5 each per month	None
Twin Falls .....		None	\$2 each per month	No private hydrants
<b>Illinois:</b>				
Cairo .....	300,000	About 20%	\$35 each	Same as city
Canton .....	75,000	15% and 15% more asked for	Nothing	None
Champaign & Urbana .....		None	\$35 each	Same as public
Chicago .....		None	Nothing	None
Chicago Heights .....	66,700 cu. ft.	Minimum rate 4c. to 5c.	Nothing	None
De Kalb .....	12,000	None	\$25 each	None
Downer's Grove .....	50,000	None, but increase proposed	Nothing	None
Duquoin .....	1,200,000	None, but increase proposed	\$256.67 per month	None for private hydrants; sprinkling by the foot
Kankakee .....	120,000	25% with 10% off for cash	\$40 per year	(b)
Lincoln .....		1c. per 100 cu. ft.	\$5 each service charge	\$50 each for fire hydrants
Mattoon .....	5,000,000	10%	No hydrants	
Mount Carmel .....	100,000	Pending, have asked 25%	\$45	Have none
Mount Vernon .....	100,000	25%	\$6,000 per year	Have no rate
Olney .....	1,000,000	None	Nothing	Meter rate
Paris .....	500,000	None		\$6 per year for sprinkling and hydrant service
Peru .....		None	\$3,000 for 110 per year	None
Princeton .....	50 cu. ft.	Removal of cash dis- count of 10%	Nothing	Have none
Quincy .....		None	No payment made, but fig- ured 200 at \$45, 50 at \$30 and balance at \$20 per year.	
Streator .....		Proposed	\$11,000 per year for 280	Hydrants, \$45; sprinkler heads, 3c
Watseka .....		None	Nothing	On meters

(a) \$10 per hydrant if furnished and maintained by owner, \$25 if by company. Sprinklers, \$10 for first hundred, 5 cts. each for all additional. (b) Service charge, from \$17.77 for 2" inside corporation limits, to \$266.66 for 12" outside; plus usage charge of from 1.667 cts to 3.111 cts per sprinkler head, and from \$11.11 to \$26.66 per hydrant, depending on size of service. (c) Old rate, minimum, 2,250 gal., \$1.50 to 10c per M, for consumption more than 90,000 gal. (d) For factories, 5c flat less 10%; commercial, 7½c less 10%.

being the unit used by about forty per cent and the latter by about sixty per cent of those stating the unit. Quite a number did not think to tell which unit they employed. As one hundred cubic feet equal 748 gallons, the price for the former unit can be compared with that for the latter by multiplying it by one and one third.

The proper understanding of some of the figures requires a reference to the tables in the June 7th issue; especially that telling the frequency of reading meters, to be used in connection with the quantities of consumption that limit the application of maximum and minimum rates.

Considerable interesting information is given concerning changes in rates made since before the war. While the majority have made no changes, quite a number have done so. Most of these changes of course have been increases, but a few have lowered their rates. The increases have been made in different ways. Some have made a straight raise. Others have decreased or abolished the cash discount; others have raised the minimum rate, etc.

The payment by the city for fire protection, generally in the form of hydrant rental, varies from nothing to almost anything. For hydrants alone the payments run as high as \$150 a year. Some cities pay the interest on the bonds as an offset to the fire protection; others pay a lump sum per year; still others make a payment including sewer flushing, use of water in public buildings, and other public uses as well as fire protection.

Even greater variety is found in the practice as to charges for private fire service. Some charge for metered consumption only; some by the size of service; others by the front foot of property; others a rate per hydrant and per sprinkler head; others base charge on value of insurance carried; others on size of building protected, etc.

The amount of free service given to private consumers will be detailed in the next issue.

(To be continued)

### MILWAUKEE WATER WORKS.

The water department of Milwaukee during 1918 had an income of \$1,174,812, of which \$1,101,277 was for water only, which was \$69,346 more than in 1917. This is a revenue of 4.819 cents per 1,000 gallons pumped. The cost of this water was 4.723 cents, this including all ordinary expenditures, sinking fund charges, depreciation, taxes and 4 per cent interest on invested capital. The cost of pumpage and ordinary expenditures only was 1.958 cents.

The net income of the department, over and above operation, maintenance, depreciation and interest on bonds, was \$580,186, of which \$200,000 was transferred to the city treasury to reduce the general taxes and the remainder was used for new construction and equipment. Since 1892 the department has transferred to the general city funds \$2,917,965, which exceeds by \$1,040,426 the sums raised for the water works by tax levies before the water department was self-sustaining.

The book value of the water works, less depreciation written off, is \$9,233,316. The bonded indebtedness less sinking fund on hand is \$210,000.

#### NEW INTAKE TUNNEL.

To secure the water supply from Lake Michigan, three intakes have been built. The first, a 36-inch pipe extending 2,100 feet into the lake, has been abandoned. The second consisted of a brick tunnel 7½ feet diameter and 3,146 feet long to a crib, from which two parallel lines of 60-inch cast-iron pipe extend 5,000 feet further into 60 feet of water. This intake ends 3½ miles from the

mouth of the harbor. It was used until December 28th, 1918, when the third or Linwood avenue intake was put into service. This intake is a concrete-lined tunnel, 12-feet in diameter and 6,554 feet long, ending in 65 feet of water. Work on this intake began in June, 1913. It terminates in a submerged crib. It was impossible to place the screen over this crib and remove from it the surplus stone and timber segments until this spring.

Before the new tunnel was placed in service it was thoroughly disinfected with a solution of hypochlorite of lime, of which 1,200 pounds was placed in the shaft in the lake and 500 pounds in the shore shaft before the tunnel was allowed to fill up. After the tunnel had been filled, water was pumped through it and wasted into the lake from November 16th to December 23d. This intake is five miles from the mouth of the harbor. It has a capacity of about 220,000,000 gallons in twenty-four hours at a velocity of 3 feet per second.

#### CONSUMPTION.

The average daily consumption during 1918 was 62½ million gallons. The maximum pumpage for any one day was 84,748,400 gallons, on July 22, and the peak rate of that day was 125 million gallons per day, or just about double the yearly average. The minimum pumpage in one day was 42,681,390 gallons, or about two-thirds the yearly average.

The average daily consumption per capita was 129 gallons (plunger displacement calculation), which seems quite high considering that more than 99 per cent of the services are metered. But H. P. Bohmann, superintendent of water works, attributes the high rate to the considerable number of large industrial consumers and not to preventable leakage, waste or unknown losses.

The total per capita consumption is divided as follows:

	Gallons Per Capita.
Dwellings and stores.....	38.55
Power and manufacturing.....	47.33
Municipal use .....	13.11
Under-registration of meters.....	2.83
Departmental free use.....	1.09
Unaccounted for .....	19.71
Allowance for pump slip.....	6.45
Total .....	129.07

Of the 86,413 taps and service pipes laid, 20,692 extend to the curb only, or are turned off at either curb or main, and are not in use. Of 1,108 taps and branches put in last year, 799 were "improvement taps" and extended to the curb only.

#### BENDS IN WATER MAINS.

A break at one point and a threatened break at another in Milwaukee last year emphasize the desirability of tying together the pipes and specials at bends, especially in large pipe and at offsets.

A 30-inch feeder line crosses under the Menomonee river, dropping down to the crossing with two 45° bends. The main here was under about 90 pounds pressure and the joints in the offset pulled apart. A similar accident was averted by the discovery of a leak in an elbow of the 36-inch main in the shaft of the Knapp street tunnel. In each case the joints were cut out, the pipes and specials were provided with lugs fastened on with heavy bands, and the several pieces tied together by 1½-inch rods.

To prevent similar accidents, whenever there is a bend or dead-end in large pipe or under any considerable pressure, each bend or other piece at the end the straight run of pipe should have lugs cast on it, as should also the last two pieces of straight pipe nearest to it, and the joints be tied together by rods or long bolts.

## The WEEK'S NEWS

**Improving Water Supplies in Ohio Cities Reduces Typhoid—Decision in Important Water Pollution Case—Rating Cities in Venereal Disease Campaign—Seven-Cent Fare Refused by Maine Commission—Company Wins in Toledo Fare Fight—Carmen's Union Sued for Pittsburgh Strike Damages—Oregon Contracts for 389 Miles of Highway—Akron Firemen and Police Get Salary Raises.**

### WATER SUPPLY

#### Typhoid Reduced by Improved Water Supply.

Columbus, O.—Water supply improvements have prevented seventy cases of typhoid fever in five cities in Ohio since the beginning of the year, according to the state department of health, basing its estimate upon a comparison of the 1919 total of cases reported to May 25, with the corresponding figures for last year. Striking evidence of the value of pure water supplies was furnished by the records of East Liverpool, Zanesville, Springfield, Ashtabula, and Conneaut. East Liverpool has reported no typhoid cases this year. Up to the corresponding time last year its reports totaled 12 cases. The city's new water purification plant began operation in July, 1918. For Zanesville the 1919 total to date is 11 cases, of which nine occurred before water from the city's new filtration plant came into general use about February 1. The other two are believed to be due to contact infection. Up to May 25 last year, Zanesville reported 30 typhoid cases. Springfield reported 27 cases in January, 1918, and in the next four months. No cases have been reported this year. Treatment of the city water supply with liquid chlorine was begun in February, 1919. Ashtabula and Conneaut placed their purification plants under expert technical supervision last November. To date this year, Conneaut has reported one typhoid case and Ashtabula none. In the first five months of last year Conneaut reported eight cases and Ashtabula three. Health department officials are awaiting with interest reports of typhoid prevalence in Ironton during the latter part of this year, after the new purification plant now nearing completion is put into operation. Thus far this year Ironton has reported 32 typhoid cases. Through May last year the total was 24. A sharp drop is expected as soon as the purified water is pumped into the mains.

#### Court Defines Water Pollution.

Rahway, N. J.—The opinion of vice-chancellor John H. Backes, directing an injunction against the Chemical Company of America to cease causing pollution of the Rahway River, leaves little leeway for that company to continue operations in its Springfield plant unless an entirely new method of disposing of waste matter is evolved by October 1, the time when the injunction against storing waste matter on the banks of the river becomes effective. The conclusion of the vice-chancellor makes it clear that the embankment of the present lagoons are inadequate, and also upsets the plea of the company that the nitration plant at Rahway was partly responsible for the condition of the water. At a hearing last May before the vice-chancellor, his conclusion says, pollution was established, but as it was not appreciable at Rahway and the company was furnishing to the Federal Government an exclusive product for the prosecution of the war, the inconveniences of the parties in these circumstances were considered and the injunction was withheld. After the signing of the armistice the state brought the case up again, declaring that the pollution continued, notwithstanding the efforts of the defendant to abate it. Despite the company's earnest endeavor to prevent it, the lagoons are not watertight and some of the waste still leaks into the streams, polluting them. A part of the easterly wall of the first lagoon is made up of a penetrable railroad embankment, through

which the liquid has been found to seep into a narrow and shallow run called Flemmer's ditch, which empties into the north branch or stream. "Personal observation," says the vice-chancellor, "bottle samples and analyses of the brook water satisfy me of this. It is also evident that the lagoons are fissured and that the diversion of the channel of the south branch furnished but a temporary remedy." Fish life in the stream in the vicinity of the factory was all destroyed during the first years of its operation as the result of the unrestrained flow of the waste into the stream, and at that time it could be smelled and tasted in the drinking water of Rahway. It is not a good plea of the defendant, says the conclusion of the vice-chancellor, that the former conditions have been mitigated and that Rahway would suffer no inconvenience if its filtration plant were up-to-date. "The aim and policy of the Legislature," says the decision, "as evidenced by the statute, is to secure to populated communities wholesome drinking water and in vindicating the sovereign right of the state to the purity of its streams, it last year adopted measures more emphatic than before by placing its ban upon specific contamination and things in general that are polluting. The original act of 1889 prohibited the discharge into or depositing upon the banks of streams of matter of a polluted character and the 1918 amendment determined such refuse and castoffs contaminating and forbade their discharge into streams or deposit upon the banks. The defendant is violating the law in respect to both of these statutes," says the vice-chancellor. The vice-chancellor goes somewhat into the definition of the word "banks" as related to a stream of water, giving the various definitions of authorities and showing that they are meant to include the region of land directly leading to the brink overlooking the stream. "The legislative scheme to purify the streams of the state contemplates the exclusion of two avenues of corruption," he states, "that of direct discharge of polluting matter into the water, which necessarily includes depositing on the bank from which it is bound to fall or flow into the stream, and that of depositing it so near the bank as to constitute a threat or menace of ultimately reaching the water contaminating it. Now to give the word 'banks' as used in the statute, a construction other than its popular signification—the immediate drainage region of lands contiguous to streams—would render the design of the second feature of the act wholly abortive. It would be playing with words and trifling with legislative mandate to hold that discharge of polluting matter on the bank anywhere below the brink would be violative of the statute, while a deposit on the land an inch away from the brink would not be."

### SEWERAGE AND SANITATION

#### Rating the Cities for Venereal Disease Work.

Washington, D. C.—The 710 cities in the United States with a population of 10,000 and over are to be graded by the Public Health Service with reference to their fighting strength in the national war against venereal diseases. It is possible for cities to make as high as 1,000 points by adopting the necessary repressive measures. The work has progressed almost to the point where actual grading will begin. The various organizations in each place have been communicated with and asked to nominate the organization best

suited to carry out the Public Health Service program. In most cities the board of health was named, but in a great many the Rotary Club was mentioned as the best organization for co-operation with the boards of health and city officials. The grading will be divided into the following points: For a city ordinance embodying the essential points for the enforcement of the state venereal disease control bill, as approved by the Public Health Service, 50 points. Free clinics for the treatment of venereal diseases, 125 points. The clinics must be in operation and well advertised. Hospital facilities for the treatment of venereal disease patients, 75 points. There should be ten beds for each 10,000 of population. Effective measures for the elimination of advertising quacks and a campaign to prevent the sale of venereal disease nostrums, 50 points. For the posting of placards to educate the public against the danger of venereal diseases, 50 points. For the distribution of educational pamphlets as published by the Public Health Service and State Boards of Health, 65 points. For delivering a certain number of lectures to the representative organizations of the city, 50 points. For the exhibition of motion pictures approved by the Public Health Service or board of health, 65 points. For an exhibit on social hygiene, 50 points. For a law prohibiting prostitution, 25 points. For a law regulating rooming houses and hotels, 30 points; for a law regulating dance halls, 25 points. For a law regulating taxi cabs, 20 points. Adequate detention facilities for delinquent girls and women, 50 points. For reformatory facilities for girl and boy sex offenders, 25 points. An institution for feeble-minded sex offenders, 25 points. For the efficiency with which the laws designed to repress prostitution have been enforced, 100 points. For teamwork among the different agencies interested in the enforcement of the law, 100 points. For the availability in public libraries of approved reading matter on social hygiene, 20 points.

#### Sanitary, Flood Prevention and Power Development.

Watertown, N. Y.—Improvements in the Black River watershed of far-reaching importance, not only from a water power standpoint, but also from the standpoint of sanitation and general public welfare, is assured by the announcement made by the commission composed of conservation commissioner Pratt, attorney-general Newton, and state engineer Williams, that it has formally ordered the creation of the Black River Regulating District. This means that now a series of storage reservoirs may be constructed in the headwaters of the Black River and its tributaries, which will maintain the flow of the water in that stream during the dry months at such a level as to guarantee power to the mills. It means that there will be less refuse lying on the river banks caused by the receding flood waters to cause a nuisance during the hot months when the water is low; and it will mean better and purer water, and a general building up of the entire district. The announcement comes as the result of a petition recently submitted to the commission by the city of Watertown and others, upon which a hearing was held in the office of the Conservation Commission in Albany. The next step will be appointment by Governor Smith, of the Black River Regulating Board, which will prepare the necessary plans by the Conservation Commission, and the organization of the machinery necessary to finance the project, and work of building the reservoirs will be put into effect. During the past three years the Conservation Commission has spent much time in making surveys of the Black River and investigating its power possibilities. It has maintained a number of stream gauging stations and has prepared maps and plans, and issued reports which will form the basis of any improvements which may be made by the Black River Regulating Board. According to the Conservation Commission, the most feasible of the many undeveloped storage sites on this watershed are the enlarged Forestport reservoir on the Black River; Higley Mountain and Panther Mountain Reservoirs, on the Moose River, and Beaver Lake, Stillwater reservoir, and Lila Lake, on the Beaver River. By the construction of these reservoirs the commission estimates that about

4,000,000,000 cubic feet of additional storage can be obtained on the Black River, about 10,000,000,000 cubic feet on the Moose River, and about 6,000,000,000 cubic feet on the Beaver River. Already there is a large industrial development on the Black River, composed mostly of paper and pulp factories, with water power installation aggregating about 90,000 installed horse power. Under present conditions, however, only about 30,000 horse power is available in dry weather. With the assistance of the above-named reservoirs, not only could the present factories run at full capacity the year round, but an estimated horse power of over 250,000 could be produced. If some of the smaller reservoir sites at a later date prove to be feasible this amount could be materially increased. From the standpoint of the general public, advantages resulting from the improvement would be the cessation of floods which annually damage private property, and abatement of the nuisance which results from debris and foul matter deposited by the receding waters. Watertown obtains its drinking water from the Black River, and in the summer months when the water is very low and the pollution of the water is correspondingly high, the work of proper filtration is extremely difficult.

## TRAFFIC AND TRANSPORTATION

### Commission Refuses Permanent 7-Cent Fare.

Augusta, Me.—The state public utility commission has refused the application of the Lewiston, Augusta & Waterville Street Railway, Augusta, to make permanent the 7-cent fare adopted by the company in June, 1918, with the approval of the commission. The commission has, however, ordered that the schedule which has been in effect "be continued for one year from June 1, 1919, unless sooner canceled by the commission." The commission is "convinced from our examination of the accounts of the company, and from our general knowledge of conditions on this particular railway and on the electric railways generally throughout the State and throughout the country, that no reduction in fares is at present warranted." The commission made the following review as to the results so far obtained:

The company at the hearing on May 21, this year, presented a statement of its operating revenues and expenses for the years 1913, 1914, 1915, 1916, 1917 and 1918, and a detailed statement of its revenues and expenses by months from June, 1916, to May 1, 1919. This statement shows that while the revenues since June, 1918, have been materially greater (with the exception of one or two months) than they were in either of the other years, it also shows that the cost of operation has in most of the months outrun the increase in revenue. It has resulted in the necessity of the passing by the company of its dividends on preferred stock, and since October, 1918, has resulted in a deficit each month—such deficit ranging from \$1,751 in April of this year, up to nearly \$20,000 in October, 1918, and it shows that for the calendar year of 1918, the deficit was \$135,915, and that the deficit for the eleven months ending May 1, 1919, was \$57,680. This latter deficit is, however, substantially less than for the same period a year previously, when the deficit was \$81,759. While the statement is not entirely encouraging, it is not anywhere near as discouraging as were the conditions the company faced a year ago. But in spite of the better showing during the past year, a substantial deficit still exists, and the company faces the proposition that wages will probably remain, for a time at least, at the present level, and other costs of operation will not be materially lessened for a considerable period of time.

### City Restrained from Interfering with Cars.

Toledo, O.—The Federal Court of Appeals at Cincinnati, has given out its opinion in the appeal of the city against the Toledo Railways & Light Company affirming the injunction decree of District Federal Judge Killits, of Toledo, restraining the city of Toledo from interfering with the company's operation of its lines in Toledo and the collection of fare at the rate of 5 cents for adults and 1 cent additional for a transfer. In its decision, the court says the injunction decree appealed does not operate to interfere with the right of the city to pass proper legislation to regulate the fares, nor does it prohibit the city from passing ordinances directing the railway to vacate the streets, remove its rails and prescribe regulations for such

removal. Neither does the court prevent the city from fixing fares and providing for exclusion of the company from the use of Toledo streets in the event the rates are so fixed and not accepted. In the opinion, Judge Dennison says:

Upon this record, and in this court, the city does not undertake to dispute the claim of the company that any rates or fare less than the proposed new schedule would have been confiscatory, and, if enforced against the company, would have been a taking of its property without justification, and would violate its constitutional rights.

By the line of decisions of the Supreme Court, culminating in the Denver Water Company and the Detroit United Railway cases, it now is clearly settled that when the franchise rights of a public service corporation to use the streets of a city expire, the city has the absolute right to order the discontinuance of the service and the removal of property from the streets; that the company has a corresponding right to make such discontinuance and removal, but that if neither party exercises this right, and if the company, at the city's request, continues to occupy the streets and to give service, the public regulating power can be exercised only subject to the condition that it must not bring about confiscation.

In the Detroit decision, the Supreme Court said that the city could have ordered the tracks from the street after the franchise expired, but that the city can not compel the company to continue its transportation business at a loss.

#### Sues Union for Damages to Public in Car Strike.

Pittsburgh, Pa.—A novel action has been brought by a Pittsburgh attorney, who is suing the Amalgamated Association of Street & Electric Railway Employees for \$2,038,000.78, which sum he estimates as the amount of the damages that were inflicted by the employees of the Pittsburgh Railways in their recent strike, which lasted four days. A. E. Anderson, in his petition for a hearing in equity in the matter, submits a tabulated bill of damages resulting from the strike. His own share of this bill is the 78 cents, the difference between his railroad fare during the strike, and car fare. The other \$2,038,000 is what he figures as the loss sustained by the riding public in paying for transportation during the strike at rates higher than carfare, by the receivership of the company in loss of revenue, and by the strikers themselves in loss of wages. Attorney Anderson has entered his suit in behalf of all of them. The suit is regarded merely as a test case. The complainant raises the point that public service employees may not lawfully strike, and he wants a court to hear his arguments and rule on the question. Mr. Anderson contends that courts have held that the right of persons to quit work and induce others to do so is "necessarily subject to limitation when employment is accepted in a business charged with public interest." His huge bill of damages is made part of his suit to show the extent to which the public interest was involved in the strike. After setting forth the circumstances of the strike, Attorney Anderson concludes with a petition to the court that it decree that the actions, rules and regulations of the defendant association, its officers and members are illegal, null and void, and that the association, its officers and members have become liable to "your orator and other citizens for the loss and damages above set forth."

### MISCELLANEOUS

#### Contracts for 398 Miles in Oregon.

Salem, Ore.—The state highway commission records show that the state up to date has contracted and under construction roads aggregating a cost of \$6,987,605.23. The total mileage is 398.7. These roads are to be paid for from the \$6,000,000 in bonds under the enactment of the legislature of 1917, the quarter-mill tax fund, automobile license receipts, receipts from the tax on gasoline and distillate imposed by the legislature of 1919, and for post and forest roads, which are included in the aggregate from the Bean-Barrett co-operative bonds under which the state receives federal aid to the extent of half the cost of construction. The \$10,000,000 bond issue of the 1919 legislature has not yet been touched by the highway commission and will not be until the last quarter of this year. Pending approval, this issue is now in the hands of bonding at-

torneys for investigation. The \$6,987,605.23 represented by projects now under construction embraces \$1,471,690.71 on the Columbia River highway, \$2,900,052.91 on the Pacific highway, \$1,097,481.70 on the West Side highway and \$1,518,379.91 on miscellaneous projects. Federal aid in the improvement of post and forest roads of the state now contracted or proposed, covering half the cost, will aggregate \$3,642,460.08, which means \$1,231,962 for post roads in western Oregon, \$953,592.08 for forest roads in western Oregon, \$1,268,182 for post roads in eastern Oregon, and \$170,724 for forest roads in eastern Oregon. Post and forest roads actually under contract in western Oregon will cost, according to the commission's records, \$1,121,828, and in eastern Oregon, \$428,033. The government's share of the cost will be half, or \$560,914 in western Oregon, and \$214,016.50 in eastern Oregon. To procure federal aid for any post road, the state is required to show that the road actually is a carrier of mails, or that there is a reasonable prospect that it will be a carrier of mails as soon as completed. The requirement relative to forest roads before federal aid is available is that they must lie wholly or in part within national forests. Government funds are forthcoming under the federal aid road act. Conceded to be the most important of federal aid projects in the state under construction at the present time, is that stretch of the John Day highway, between Dayville, Grant county, and Fossil, Wheeler county. This improvement will open up an immense new territory to traffic, and besides will make an automobile trip from Ontario to Portland 120 miles shorter than the trip by railroad. New coast country will be opened to traffic, and distances will be appreciably shortened by lateral roads projected to connect the Pacific highway with the coast. Surveys are now being made for a post road from Roseburg to Myrtle Point, and a forest road from Eugene to Florence. A forest project extending from Corvallis to Waldport, by way of the Alsea river, is contemplated and the survey for a new highway from Corvallis to Newport will be made this summer. The road from McMinnville to Tillamook, now under construction, will be completed this year. Next winter it will be possible to travel by automobile from McMinnville to Tillamook, and it may be possible to motor the entire distance from the northern to the southern boundaries of the state on the Pacific highway.

#### Akron Claims to Have Highest Paid Firemen.

Akron, O.—The new budget for the last half of 1919 contains salary increases for the fire and police departments. These raises were granted without request by the men, the fire chief being responsible for the efforts to have the raise put into effect. The firemen now claim to be "the highest paid in the world, and expect to get more in not many moons," according to the statement of one of them. A. L. Headbough, of Truck No. 1, says: "This is one department where the men are a unit; there is no discontent, and no radical elements exist. We do not have any outside advice to better our conditions. This department goes on every other day off Jan. 1, 1920. This is another time our city officials were broad-minded, and gave the increase without our having to go before them." The new salaries in the fire department are as follows: Chief, \$3,600; assistant, \$2,580; superintendent machinery, \$2,460; superintendent police and fire alarm system, \$2,460; fire warden, \$2,268; mechanic, \$2,100; department secretary, \$2,040; four linemen, \$1,932; ten captains, \$2,160; ten lieutenants, \$1,980; two engineers, \$1,926; four assistant engineers, \$1,860; 88 firemen, as follows: fourth year, \$1,800; third year, \$1,680; second year, \$1,560, and first year, \$1,500. In the police department, the salaries will be: Chief, \$3,000; secretary, \$2,520; captain, \$2,400; two lieutenants, \$2,160; eight sergeants, \$1,980; four detectives, \$2,160 each; three signal operators, \$1,860; two plain clothesmen, \$1,860; 102 patrolmen as follows: fourth year, \$1,800; third year, \$1,680; second year, \$1,560; first year, \$1,500; two stenographers, \$1,140 each; the matron, \$960, and the surgeon, \$600.

## NEWS OF THE SOCIETIES

**Aug. 26-28.—LEAGUE OF CITIES OF THE THIRD CLASS IN PENNSYLVANIA.** Twentieth annual convention, Allentown, Pa. Secretary, Fred H. Gates, city clerk, Wilkes-Barre, Pa.

**Aug. 27-29.—VIRGINIA STATE FIREMEN'S ASSOCIATION.** Thirty-third annual meeting, Charlottesville, Va. Secretary, E. K. Landis.

**Oct. 27-30.—AMERICAN PUBLIC HEALTH ASSOCIATION.** Annual meeting, New Orleans, La. Secretary, A. W. Hedrich, 169 Massachusetts ave., Boston, Mass.

**Nov. 12-14.—AMERICAN SOCIETY FOR MUNICIPAL IMPROVEMENTS.** Annual convention, New Orleans, La. Secretary, Charles C. Brown, Springfield, Ill.

### American Engineering Standards Association.

The American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers and American Society for Testing Materials some time ago invited the government departments of War, Navy and Commerce to appoint representatives to act with them to continue the work of developing engineering standards. Standardization received great impetus during the war because of the need of avoiding confusion caused by differing standards promulgated by various organizations. The body so formed is the American Engineering Standards Committee. It has required considerable time to definitely formulate its objects, and to arrange methods for accomplishing them that would be effective without in any way interfering with the many organizations that have been doing such work.

A new constitution of the committee changes the name to American Engineering Standards Association, the change from "committee" to "association" being regarded as more fittingly indicating the wide scope of the interests involved.

The objects of the association are stated as follows:

1. To unify and simplify the methods of arriving at engineering standards, to secure co-operation among various organizations and to prevent duplication of standardization work.
2. To promulgate rules for development and adoption of standards.
3. To receive and pass upon recommendations for standards submitted as provided in the rules of procedure, but not to initiate, define or develop the details of any particular standard.
4. To act as a means of intercommunication between organizations and individuals interested in the problems of standardization.
5. To give an international status to approved American engineering standards.
6. To co-operate with similar organizations in other countries and to promote international standardization.

Several important organizations interested in standardization will be invited to appoint representatives as soon as the necessary power is obtained. Any organization may request the association to approve standards which it

has formulated, or to approve committees that it has appointed, and by so doing becomes a sponsor society.

The association, in short, is to bring together those interested in a common object, and when they have completed their work, will at their request, certify that it has been done in such a manner as to justify its adoption. The executive committee of the American Society for Testing Materials now passes on the composition of the committees, ascertains that their conclusions are substantially unanimous, and if so, reports them to the society for acceptance or rejection. The association does the same for groups of organizations.

The association has headquarters in the Engineering Societies Building, 29 West Thirty-ninth Street, New York. Prof. Comfort A. Adams is chairman and Clifford B. LePage is acting secretary. George C. Stone, New Jersey Zinc Co., is vice-chairman, and John A. Capp, General Electric Co., Schenectady, N. Y., Henry Hess, Philadelphia, and Harry N. Latey, railway department, General Electric Co., New York, are members of the executive committee.

### Southwestern Water Works Association.

At the convention of the Southwestern Water Works Association held in Kansas City, Mo., June 23-26, the members decided to reject the invitation of the American Water Works Association to affiliate with the latter. It was also determined to publish a monthly journal. The territory of the association was enlarged to take in Nebraska, and the name changed to the South-West Water Works Association, the hyphen indicating that the organization proposes to serve the South and the West—Mississippi, Colorado and one or two other states perhaps being included.

Two issues of the journal have been circulated already among the members and prospects in the territory, sufficient advertising having been obtained to more than defray the cost.

W. L. Benham presented an illustrated paper on the "Operation of the Camp Funston Utilities," together with a description of a manual of operation finally adopted as standard for all of the camps under the Maintenance and Repair Division. In the discussion of meters as detectors of waste, J. Smith, of Emporia, Kan., described a home-made clock device applicable to household meters which would make a continuous record of the consumption.

In a round-table discussion of the question, "At What Charge Per Month Can a 58-in. Meter Be Installed and Maintained When Owned by the City?" J. F. Anderson, who has kept meter records in Kansas City for 26 years, stated that the cost of setting varied from 50c to \$7.50, and the annual

maintenance from 3c to \$2.50 annually.

Leon I. Kahn, Shreveport, La., was elected as president and E. L. Fulkerson, Waco, Tex., as secretary. The 1920 convention will be held in New Orleans and in October instead of June or July.

### Joint Committee on Concrete Pipe.

The joint committee of various societies to prepare specifications on concrete pipes and culverts has been organized. The societies joining in are the American Railway Engineering Association, the American Association of State Highway Officials, the American Concrete Institute, the American Society for Testing Materials, and the Concrete Pipe Association. The first sub-committee which is actively to begin work is one which is to prepare specifications on culvert pipe.

## INDUSTRIAL NEWS

### Concrete Swimming and Wading Pools.

A new bulletin has been published by the **Portland Cement Association** on the subject of swimming and wading pools of concrete construction. The whole subject is interestingly covered in a practical way, from the selection of a good site to the proper way of constructing a springboard. Actual plans and specifications are given for various types of construction and each point is illustrated with photographs of successful practice.

**The Dayton-Dowd Co., Quincy, Ill.,** has issued a new bulletin, No. 240, showing its re-designed line of CS single stage, double-suction type centrifugal pumps. The publication is completely illustrated with photographs and sectional diagrams of the different types of pumps and of interesting installations. The features of construction and operation of the pumps are convincingly described. Important points of design and performance are brought out by characteristic curves of tests. Useful electrical and hydraulic data are given in the bulletin.

### "Protecting the Water Supply of Greater New York."

This is the title of a new edition of technical publication No. 5 issued by **Wallace & Tiernan Co., Inc.** This describes and illustrates some of the points of interest in the great water supply system of New York City, especially chlorination. The chlorinating units at different stations are shown and their work described. The publication is excellently gotten up and properly illustrated with photographs, maps and charts. It should prove of decided interest to anyone concerned with water supply.

The company has also issued a striking folder entitled "How Much Is Three Billion Gallons?" This is the amount being rendered safe daily by chlorination with "W. & T." control apparatus.

# ADVANCE CONTRACT NEWS

## ADVANCE INFORMATION BIDS ASKED FOR

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

## BIDS ASKED FOR

### STREETS AND ROADS.

**Ark., Jonesboro.** July 28. Improving roads in Craighead Co., involving four acres clearing and grubbing; 86,000 cu. yd. earth work, 118,980 sq. yd. waterbound macadam paving, 118,980 sq. yd. asphaltic surface treatment, 1,268 cu. yd. concrete, 60 lin. ft. 18 to 30-in. vitrified clay pipe and 60 lin. ft. 18 to 30-in. reinforced concrete pipe, 1,000 lin. ft. vitrified tile underdrain, seven steel bridges and 255 lin. ft. wooden bridges, etc.—Corb & Lee, Dist. Engrs., American Trust Bldg.

**Ala., Montgomery.** 11 a.m., July 29. Paving 15,000 sq. yd. with brick, asphalt, bitulithic, mineral rubber, wood block, concrete or asphaltic concrete.—S. E. Washburn, City Engr.

**Ala., Birmingham.** Aug. 4. \$200,000 worth of road work, including paving city streets principally with macadam, and county work.—Bd. of Revenue.

**Ark., Marion.** 11 a.m., July 24. 11 mi. earth road embankment, involving 130,000 cu. yd. embankment.—Morgan Engrg. Co., Memphis, Tenn.

**Colo., Denver.** Aug. 24. Paving alley paving district No. 50 and 51 with concrete.—J. B. Hunter, City Engr.

**Fla., Seabreeze.** 8 p.m., July 24. 42,000 sq. yd. hard surface pavement, 10,500 lin. ft. 12 to 27-in. drain pipe, 120 catch basins, 25 manholes, 34,000 lin. ft. 4x10 concrete curb, 7,000 cu. yd. excavation.—C. M. Rogers, Engr., Daytona.

**Fla., Quincy.** 4 p.m., Aug. 5. 27,100 sq. yd. paving.—J. B. McCrary Co., Engrs., Atlanta.

**Ga., Rome.** 2 p.m., July 22. Seven mi. road through Floyd Co., including drains, culverts, etc., involving 15,687.5 cu. yd. earth excavation, 13,124.8 cu. yd. borrow excavation, 20,080.3 cu. yd. top soil surfacing, 472.5 lin. ft. 12 to 24-in. D. S. vitr. clay pipe, etc.—J. B. McCrary Co., Engrs., Third Natl. Bank Bldg., Atlanta.

**Ind., Hammond.** 10 a.m., July 23. Paving and grading roadway with asphalt macadam pavement or vitrified paving brick on 6-in. concrete base or one or two-course concrete, 600 lin. ft. 9-in. vitrified socket pipe, one catch-basin, two gutter inlets and 1,683 lin. ft. cement curb, etc.—Bd. Pub. Wks.

**Ind., Boonville.** 10 a.m., Aug. 5. Three roads in Boon and Ohio Twp.—W. A. Campbell, Co. Aud.

**Ind., Crown Point.** 1 p.m., Aug. 5. Three gravel roads in Cedar Creek, Winfield and Eagle Creek, and Winfield and Center Twp.—G. M. Foiland, Co. Aud.

**Ind., Rochester.** 2 p.m., Aug. 5. Two gravel roads in Henry and Rochester Twp.—E. A. Smith, Co. Aud.

**Ind., Corydon.** 2 p.m., Aug. 5. 15,480 ft. stone road in Jackson Twp.—S. C. Mauck, Co. Aud.

**Ind., Bloomfield.** 2 p.m., Aug. 5. Fifteen macadam roads in Richland, Wright, Smith, Stockton, Fairplay, Center, Taylor, Stafford, Jefferson and Grant Twp.—H. Corbin, Co. Aud.

**Ind., Logansport.** 10 a.m., Aug. 5. Seven roads in Boone, Miami, Adam, Deer Creek, Jackson, Noble and Eel Twp.—H. M. Gardner, Co. Aud.

**Ind., Winchester.** 10 a.m., Aug. 5. 3,545 ft. gravel road between West River and White River Twp.—J. M. Twps.—J. M. Brown, Co. Aud.

**Ind., Greenfield.** 2 p.m., Aug. 2. Two mi. gravel and concrete road and two mi. gravel road in Buck Creek Twp.—C. Boone, Co. Engr.

**Ind., Indianapolis.** 10 a.m., July 22. Gravel road on line between Pike and Washington Twp.—L. K. Fesler, Co. Aud.

**Ind., Shelbyville.** 10 a.m., July 23. 10,600 ft. gravel road on line between Shelby and Hancock Cos.—F. W. Fagel, Co. Aud.

**Ind., Huntington.** 2 p.m., Aug. 5. Co. line road between Whitley and Huntington counties.—O. E. Eviston, Co. Aud.

**Ind., Evansville.** 10 a.m., July 24. Road in Knight Twp.—W. M. Copeland, Co. Aud.

**Ind., Noblesville.** 10 a.m., July 26. Concrete road in Noblesville Twp.—H. O. Cottingham, Co. Aud.

**Ind., Lebanon.** 10 a.m., Aug. 5. Concrete road in Eagle Twp.—C. Goodwin, Co. Aud.

**Ind., Brownstown.** 1 p.m., Aug. 4. Gravel road in Carr and one in Brownstown Twp.—A. Luedtke, Co. Aud.

**Ind., Rensselaer.** 2 p.m., Aug. 4. Four roads in Jordan, Carpenter and Grove Twp.—J. P. Hammond, Co. Aud.

**Ind., Fort Dodge.** 1.30 p.m., July 22. Grading, draining, graveling and incidental work on Federal-aid highway.—C. A. Snook, Co. Aud.

**Ind., Marion.** July 26. Paving boulevard between here and Cedar Rapids; also one-half mi. on Indian Creek Hill.—Bd. Supvrs., Linn Co.

**Kan., Junction City.** July 28. 50,000 sq. yd. 3-in. vertical fibre brick No. 1 brick block, concrete or asphaltic concrete pavement; 10,000 cu. yd. excavation, and 20,000 lin. ft. curb and gutter.—J. N. Bridgman, City Paving Engr.

**Mass., Boston.** noon, July 22. 10,900 ft. asphalt road in Randolph and 13,500 ft. asphalt road in Seekonk.—F. I. Bieler, Secy., State Hwy. Comm., State House.

**Minn., Duluth.** 11 a.m., July 30. Paving street.—J. A. Farrell, Comr.

**Mo., Boonville.** Aug. 4. Resurfacing 1,100 ft. 50-ft. roadway with new brick blocks.—C. G. Miller, City Clk.

**Mo., St. Joseph.** July 26. Grading and paving 2.2 mi. state road with 2½-in. asphaltic concrete, 18 ft. wide.—J. D. Mohler, Special Hwy. Engr.

**Mo., St. Louis.** noon, July 25. Paving 1,038 ft. roadway with bitulithic, 30 ft. wide, and constructing curb.—W. W. Horner, City Engr.

**N. J., Perth Amboy.** 2.30 p.m., July 31. Repairing road in Middlesex Co. with warrenite surface on concrete foundation, involving 10,000 sq. yd. warrenite and 7,000 sq. yd. bituminous macadam, 10,000 sq. yd. concrete and 7,000 sq. yd. macadam for foundation.—A. B. Fox, Co. Engr., 175 Smith St.

**N. J., Metuchen.** 8.30 p.m., July 24. Excavating and laying to grade blue stone or concrete curbs.—E. A. Burroughs, Boro. Clk.

## CONTRACTS AWARDED ITEMIZED PRICES

**N. J., Elizabeth.** 2.30 p.m., July 24. Repaving street, involving 26,025 sq. yd. new granite block on 6-in. concrete base, 8,681 sq. yd. napped trapped blocks on 6-in. concrete foundation between railways tracks and 10,600 lin. ft. new bluestone curb.—Bd. Pub. Wks.

**N. J., Elizabeth.** 2.30 p.m., July 27. Two roadway intersections of macadam or amiesite in Summit; 5,500 ft. bituminous concrete roadway on old and new macadam base in New Providence.—J. L. Bauer, Co. Engr., 120 Broad St.

**N. Y., Buffalo.** noon, July 21. Repairing driveway.—J. F. Malone, Comr. Parks and Pub. Bldgs.

**N. Y., Albany.** 3 p.m., July 21. Improving city streets, involving grading, constructing grass plots, setting granite curb, paving driveways with asphalt or asphaltic concrete on concrete foundation, laying concrete sidewalks, building receiving basins, paving driveways with asphalt or vitrified shale blocks on concrete foundation, extending sewer laterals and water services, etc.—I. Wachsman, Secy., Bd. Contr. and Supply, City Hall.

**N. Y., Lockport.** 2 p.m., July 25. 2.07 mi. bituminous macadam road in town of Hartland, 3.5 mi. bituminous macadam road in Wheatfield, 3.65 mi. bituminous macadam in Royalton, 2.3 mi. concrete pavement between city and town of Lockport and 3.07 mi. bituminous macadam road in Pendleton.—F. H. Krull, Clk., Bd. Co. Supvrs., Court House.

**N. Y., St. George, S. I.** noon, July 23. Repairing roadway with wood block pavement, involving 900 sq. yd. new and 300 sq. yd. old pavement relaid, and 200 cu. yd. concrete foundation.—C. D. Van Name, Pres., Boro. of Richmond.

**N. Y., Albany.** 1 p.m., July 29. Improving 11.42 mi. highways in Chautauqua and Jefferson counties; completing 114.65 mi. highways in Allegany, Cattaraugus, Cayuga, Dutchess, Franklin, Jefferson, Monroe, Oneida, Onondaga, Orange, Schuyler and Wayne counties.—F. S. Greene, Comr. Hwys.

**N. Y., New York.** 2 p.m., July 21. Repaving with granite block on concrete foundation; also furnishing 11,000 cu. yds. asphalt wearing surface sand, grade "B"—F. L. Dowling, Pres., Boro. of Manhattan.

**N. Y., South Glens Falls.** 8 p.m., July 21. Concrete pavement with or without integral curbing.—C. E. Moore, Vil. Pres.

**N. Y., Buffalo.** 11 a.m., July 22. Paving 17 city streets and repaving 1 street.—Bureau of Engrg., Dept. Pub. Wks.

**N. Y., Albany.** 1 p.m., Aug. 5. Improving 4.59 mi. highway in Warren Co.; also completing 11.63 mi. in Broome, 11.41 mi. in Franklin, 10.56 mi. in Genesee, 10.17 mi. in Rensselaer, 15.76 mi. in St. Lawrence, 5.13 mi. in Warren and 4.73 mi. in Wyoming counties.—F. S. Greene, State Hwy. Comr.

**N. Dak., Bismarck.** 3 p.m., Aug. 1. 22.04 mi. earth road in Logan Co., Federal-aid Project No. 35.—W. H. Robinson, Chief. Engr. and Secy., State Hwy. Comm.

**O., Kent.** noon, July 25. Grading, draining, curbing and paving 8,500 sq. yd.—R. C. Harvey, Engr.

**O., Yorkville.** Aug. 4. Paving with hard burnt vitrified brick set on edge, hard burnt vitrified block or concrete.—J. A. Hagan, Clk.

## BIDS ASKED FOR

**O., Columbus.** noon, July 29.  
Grading, draining, curbing, repaving roadway with asphalt over present surface, and laying water service pipe and sewer connections; paving roadway with concrete, etc., and paving roadway with asphalt or brick, etc.—G. A. Borden, Dir. Pub. Serv.

**O., Ironton.** noon, July 23.  
Paving with brick, cement or other suitable material.—F. A. Ross, Clk., Bd. Pub. Serv.

**O., Cincinnati.** July 25.  
Repairing washouts on road in Anderson Twp.—A. Reinhardt, Clk., Bd. Comrs.

**O., Cleveland.** noon, July 25.  
Bituminous concrete wearing surface on West Blvd.—Park Engr., 435 City Hall.

**Okla., Vinita.** Aug. 5.  
Ten blocks macadam pavement.—E. Baker, City Clk.

**Pa., Gallitzin.** 8 p.m., July 30.  
(Readvertisement.) 6,000 sq. yd. vitrified brick pavement on concrete base, 3,000 cu. yd. excavation and 175 lin. ft. stone protection curb.—D. W. Dillman, Boro. Engr., 80-81 Altoona Trust Bldg., Altoona.

**Pa., Harrisburg.** 10 a.m., July 29.  
Reconstructing 468,834 ft. roads with one or two-course reinforced concrete, hillside vitrified brick, bituminous surface course on concrete foundation and on telford foundation, and bituminous mixtures on prepared broken stone base, in Adams, Beaver, Bradford, Bucks, Chester, Delaware, Crawford, Erie, Fayette, Jefferson, Lawrence, Mifflin, Montgomery, Northampton, Susquehanna, Washington and Westmoreland counties.—L. S. Sadler, State Hwy. Comr.

**Pa., Sharpsville.** 5 p.m., Aug. 5.  
Paving 5,000 sq. yd. with brick block or other materials.—W. A. Graber, Secy., Boro. Council.

**Wash., Seattle.** 10 a.m., July 27.  
Paving with brick block on concrete foundation, paving several streets, constructing concrete curbs and brick gutters, surface drainage, sewers, side sewers and water mains, concrete sidewalks, grading and regrading, wood crosses and gutters, concrete and wood crosswalks, etc.—City Engr., County-City Bldg.

**Que., Quebec.** July 23.  
Nine mi. waterbound macadam roads in town of St. Antoine.—M. Henry, Dept. Roads.

## SEWERAGE.

**Conn., Stratford.** 8 p.m., July 21.  
Completing sewage disposal plant, chlorine treatment house and tidal basin, and sludge bed, including necessary piping, grading, etc.—Clyde Potts, 30 Church St., N. Y. City.

**D. C., Washington.** 2 p.m., Aug. 4.  
Trunk sewers, involving 9,600 lin. ft. 2 to 9-in. sewers.—Chf. Clk., Engr. Dept., 427 Dist. Bldg.

**Ill., Bradley.** 2 p.m., July 22.  
40,000 ft. vitrified tile pipe and brick sewers, from 10 to 48-in., involving 24,000 cu. yd. rock excavation.—Marr, Green & Co., Engrs., 17 N. La Salle St., Chicago.

**Kan., Wamego.** 8 a.m., July 29.  
12,500 lin. ft. sanitary sewer, with necessary manholes and flushing tanks.—Doyle, City Clk.

**Mo., Kansas City.** 2 p.m., Aug. 19.  
Constructing Turkey Creek sewer, two sewage pumping stations, laterals and extensions of existing sewers, consisting of 1.2 mi. main sewer of reinforced concrete and 3½ mi. laterals and extensions of concrete, segment blocks or clay pipe.—A. D. Ludlow, Engr. of Sewers, City Hall.

**Mo., Milan.** July 25.  
Sanitary sewers and sewage disposal plant.—Archer & Stevens, 609 New England Bldg., Kansas City, Engrs.

**Neb., Deshler.** July 25.  
Sewers.—W. E. Standeven, Engr., 414 Peters Trust Bldg., Omaha.

**Neb., Wakefield.** Aug. 5.  
17,240 ft. 8-in., 9,668 ft. 10 to 15-in. vitrified stone sewers in various streets.—W. E. Standeven, 414 Bee Bldg., Omaha.

**N. Y., L. I. City.** 11 a.m., July 21.  
Sanitary and storm water sewers, temporary screening plant and appurtenances, cut-off and overflow chamber and appurtenances, and pumping station sufficient to provide for pumping 576,000 gal. per day.—M. E. Connolly, Pres., Boro. of Queens.

**N. Y., New York.** 2 p.m., July 21.  
Emergency repairs to sewers in city street.—F. L. Dowling, Pres., Boro. of Manhattan.

**Pa., New Bethlehem.** 8 p.m., July 28.  
Vitrified pipe sanitary sewers, consisting of main intercepting sewer and various lateral sewers from 8 to 18 in., with necessary manholes, etc.—D. M. Geist, Secy. to Council.

**R. I., Woonsocket.** 5 p.m., July 24.  
3,530 ft. 8-in., 1,025 ft. 16-in. and 230 ft. 15-in. sanitary sewer and appurtenances.—F. H. Mills, City Engr.

**S. C., Batesville.** Aug. 15.  
Constructing sewers.—M. E. Rutland, Mayor.

**S. D., Aberdeen.** 9 a.m., July 28.  
Storm sewer, involving 8 mi. vitrified, segmental block or concrete pipe from 10 to 96 in. in diameter, with 100 manholes and 212 catch basins.—F. W. Raymond, City Aud.

**Ont., Harrison.** July 24.  
Laying 17,932 ft. sewer.—W. D. McLeelan, Twp. Clk.

## WATER SUPPLY.

**Colo., Boulder.** 5 p.m., July 22.  
Water transmission line, involving 650 ft. 21-in., 3,360 ft. 18-in., 10,700 ft. 15-in. and 2,975 ft. 12-in. vitrified pipe, five concrete surge chambers, one concrete intake and miscellaneous fittings.—Dept. Pub. Serv.

**Ky., Ashland.** 4 p.m., July 24.  
Pumping station and filtration plant, involving coagulating and clear water basins and station buildings; filtration equipment (2,000,000 gal. daily capacity); centrifugal pumping equipment (7 units); 35,000-gal. wash water tank; Venturi meter; cast iron pipe and fittings; and valves.—Alvord & Burdick, Engrs., 1417 Hartford Bldg., Chicago, Ill.

**Minn., Litchfield.** Aug. 1.  
Addition to water works system and sewers.—L. P. Wolff, 1001 Guardian Life Bldg., St. Paul.

**N. Y., Fulton.** 8 p.m., July 21.  
Furnishing cast iron water pipe and special castings, involving 95 tons 12-in. and 649 tons 16-in. class D pipe.—G. A. Washburn, City Clk.

**N. Y., Albany.** 3 p.m., July 22.  
Furnishing experimental extraction and distilling apparatus, water still, auto-claves, etc.—L. F. Pilcher, State Archt., Capitol.

**O., Cleveland.** noon July 24.  
Furnishing fire hydrants and valves for Div. of Water.—Comr. Water, 211 City Hall.

**O., Akron.** noon, July 25.  
Elevated water tank, 150,000-gal. capacity with 70-ft. tower (monolithic tower and tank of reinforced concrete, or steel tower and tank enclosed in reinforced concrete shell).—Bureau of Water Works Improvement, 102 E. Mill St.

**O., Ashland.** noon, July 22.  
Filtration plant and auxiliary pump station (1,500,000-gal. capacity plant), 24-in. pipe line 3,375 ft. long, and 16-in. pipe line 5,900 ft. long, connecting with proposed filtration plant; earth dam and dikes, comprising 47,000 yds. grading, concrete core wall, concrete overflow and outlet chambers, pipe lines and gate valves, sluice gates, etc.—R. Winthrop Pratt, Hippodrome Bldg., Cleveland.

**Wash., Seattle.** 10 a.m., July 27.  
Water mains in city streets, with fire hydrants where necessary.—City Engr., County-City Bldg.

**W. Va., Parkersburg.** 10 a.m., July 25.  
Filter bed for city water works.—C. A. Musgrave, City Clk.

## LIGHTING AND POWER.

**Kan., Osawatomie.** 8 p.m., July 28.  
Lighting system.—Black & Veatch, Engrs., 507 Inter-State Bldg., Kansas City, Mo.

**N. Y., Brooklyn.** 3 p.m., July 23.  
Additional power house equipment for state hospital here.—L. F. Pilcher, State Archt., Capitol, Albany.

**N. Y., New York.** 11 a.m., July 24.  
Furnishing incandescent electric lamps.—N. J. Hayes, Comr. Water Supply, Gas and Electricity.

**Ecuador.** Sept. 1.  
Electric light and power plant.—File No. 119,670, Bureau of Foreign and Domestic Commerce, Washington, D. C.

**Sask., Fort Qu'Appelle.** July 31.  
Supplying three horizontal return tubular boilers, 72 in. by 16 ft., furnaces, suspension, etc., erecting and boilers, etc., at power house, at sanitarium here.—Secy., Saskatchewan Anti-Tuberculosis League, 415 McCallum-Hill Bldg., Regina.

## FIRE EQUIPMENT.

**O., Lorain.** July 21.  
One combination chemical and hose car and one combination pumping engine and hose car complete with 600-gal. capacity per minute.—L. H. Johnson, Clk., Bd. Pub. Safety.

**O., Xenia.** July 24.  
Furnishing new fire apparatus.—City Clk.

## BRIDGES.

**Ark., Little Rock.** 2 p.m., Aug. 4.  
Foundations, piers, superstructure and approaches, etc., of 2 reinforced concrete bridges across Arkansas River, 1,450 ft. and 1,091 ft. in length, involving 55,000 cu. yd. reinforced concrete.—Hedrick & Hedrick, Bridge Engrs.

**Fla., Jacksonville.** July 29.  
2,100-ft. bridge over St. Johns River.—F. Brown, Duval, Co. Clk.

**Fla., Jacksonville.** July 22.  
Bridge across St. Johns River.—County Comrs.

**Ga., Rome.** noon, July 22.  
Concrete bridge across Cabin Creek in Floyd Co.—J. R. Cantrell, Chmn., Bd. of Comrs. of Roads and Revenues.

**Ill., Pontiac.** 11 a.m., July 26.  
Two bridges in Newton Twp., Livingston Co.—G. D. Butzer, Co. Supt. Hwys.

**Mich., Lansing.** 1:30 p.m., July 23.  
Bridge over Pigeon River in Olive Twp.; reinforced concrete arch bridge over drain in Jamestown Twp., all in Ottawa Co.—F. F. Rogers, State Hwy. Comr.

**Minn., Walker.** 10 a.m., July 22.  
Bridge on State road in Cass Co.—C. D. Bacon, Co. Aud.

**Mont., Huntley.** July 25.  
950-ft. bridge over Yellowstone River in Huntley Twp., consisting of five 190-ft. steel spans on concrete piers and abutments.—P. D. Pratt, State Hwy. Engr., Helena.

**Mont., Livingston.** July 25.  
Bridge over Yellowstone River in Park Co., 270 ft. long, consisting of 3-span concrete arch.—P. D. Pratt, State Hwy. Engr., Helena.

**Neb., Lancaster.** 10 a.m., July 26.  
Concrete bridge in Lancaster Co.—W. L. Minor, Co. Clk.

**N. J., Rahway.** 2:30 p.m., July 27.  
Concrete and steel beam, 3-span bridge over Rahway River.—J. L. Bauer, Co. Engr., 120 Broad St., Elizabeth.

**N. Y., Elmira.** July 21.  
Concrete and steel construction on bridge over Chemung River.—City Engr., City Hall.

**O., Lebanon.** July 28.  
Replacing abutment to bridge over Twin Creek, Warren Co.—M. E. Ross, Co. Aud.

**O., Bowling Green.** July 28.  
Reinforced concrete bridge in Washington Twp. and one in Milton Twp.—R. S. Gillespie, Co. Aud.

**O., Cincinnati.** noon, Aug. 1.  
Concrete wing to bridge in Springfield Twp.—A. Reinhardt, Clk., Bd. Co. Comrs.

**O., Painesville.** Aug. 4.  
Repairing bridge in Painesville Twp.—A. Davis, Co. Aud.

## BIDS ASKED FOR

**W. Va., Welch.** 4 p. m., July 29.  
Reinforced concrete floor on bridge near Roderfield; 2 concrete abutments and one 125-ft. span steel truss bridge near Roderfield; one steel truss bridge over Dry Fork at Iaeger; 2 concrete abutments and one 150-ft. span steel truss bridge west of Iaeger.—Engr., McDowell Co.

**Dominican Republic, Santo Domingo.** 10 a. m., Sept. 30.  
Rein. Concr. bridge and approaches over the Rio Yaque del Sur in the Province of Azua, consisting of 2 rein. concr. arches 91 ft. span each, and 4 slab spans 22 ft. each, 304 ft. long and 18 ft. 9 in. wide.—Dir. Gen. Pub. Wks.

## MISCELLANEOUS.

**Cal., San Francisco.** 2 p. m., July 30.  
Constructing Hetch Hetchy dam and appurtenant works in Tuolumne Co., involving 77,000 cu. yd. excav. below stream level; 60,500 cu. yd. excav. above stream level; 298,800 cu. yd. cyclopean masonry, and 66,850 cu. yd. concr.—M. M. O'Shaughnessy, City Engr.

**D. C., Washington.** 10:30 a. m., Sept. 2.  
Cargo handling cranes, air compressors, electric motor and spares, starting panels, motor-driven triplex pump, Hamilton-Corliss engine, fiber conduit bends, steel dump cars, etc.—A. L. Flint, Gen. Purch. Agt., Panama Canal.

**Fla., Ft. Pierce.** 2 p. m., July 30.  
Inlet cut and riprapping (inside work), and outside channel and jetties (outside work), involving 85,000 cu. yd. earth excav.; 1,720 cu. yd. jetty hearting, 2,200 tons jetty capping and 1,200 cu. yd. riprap.—M. Hallows, Chief Engr., Ft. Pierce Inlet Dist.

**Fla., Jacksonville.** Noon, Aug. 2.  
Dredging and rock removal in St. Johns River.—U. S. Engr. Office.

**Fla., Jacksonville.** noon, July 24.  
Jetty at entrance to St. Johns River.—U. S. Engr. Office.

**Idaho, Boise City.** 2 p. m., July 22.  
Furnishing three four-wheeled, reversible rubber-tired trailer chassis for Street Dept.—Phoebe Orvis, City Clk.

**Ill., Morris.** 1:30 p. m., Aug. 2.  
85,150 cu. yd. excavation and 5,500 cu. yd. rock in main outlet ditch.—Comrs., Claypool Drainage and Levee Dist.

**Ill., Chicago.** 10 a. m., July 29.  
Concrete caisson breakwater and lighthouse crib at Indiana Harbor, Ind.—U. S. Engr. Office, 508 Federal Bldg.

**La., Algona.** 3 p. m., July 24.  
Drainage improvement in Emmet and Kossuth joint drainage district.—Bd. Supvrs.

**Mass., Boston.** Aug. 1.  
Dredging and building new wharf and retaining wall at light house depot, Chelsea.—Light House Supt.

**Mich., Sault Ste. Marie.** 4 p. m., July 22.  
Dredging Grosse Pointe Channel, Lake St. Clair.—U. S. Engr. Office.

**Miss., Gulfport.** noon, July 22.  
12.9 mi. drainage ditches here.—H. D. Shaw, Engr.

**N. J., Atlantic City.** 3 p. m., July 31.  
Harbor improvement involving 723,000 cu. yd. excavation, 4,000 lin. ft. sod banks for retaining fill, 1,080 lin. ft. wood bulkhead, 25-ft. by 200-ft. wharf, etc.—J. W. Hackney, City Engr., City Hall.

**N. J., Somers Point.** 8 p. m., July 21.  
Reconstructing municipal pier.—J. E. Scull, City Clk.

**N. Y., Buffalo.** July 31.  
Rubble mound protection and sand fill protection on Presque Isle Peninsula, Erie Harbor, Pa.—U. S. Engr. Office, 540 Federal Bldg.

**N. Y., New York.** Aug. 7.  
Dredging and removing rock in East River.—U. S. Engr. Office, 39 Whitehall St.

**N. Y., New York.** Noon, July 28.  
Dredging San Juan harbor, Porto Rico, and filling adjacent swamp lands with material dredged.—U. S. Engr. Office, 812 Army Bldg., 39 Whitehall St.

**N. Y., New York.** noon, July 21.  
Dredging in Passaic River, N. J.—U. S. Engr. Office, 39 Whitehall St.

**O., Kenton.** noon, Aug. 6.  
Drainage system and flood control, involving 2,036,400 cu. yd. earth excavation, 6,290 cu. yd. rock excavation, 13,713 cu. yd. leveling waste bank and 12,736 cu. yd. removing waste bank.—Morgan Engrg. Co., Dayton, Chief Engrs.

**O., Cincinnati.** 2 p. m., Aug. 1.  
Lock and abutment for dam in Ohio River, near Chilo.—U. S. Engr. Office, First Dist.

**O., Cincinnati.** 2 p. m., July 28.  
Furnishing stone at dam in Ohio River.—U. S. Engr. Office, 405 Custom House.

**Pa., Philadelphia.** noon, July 25.  
Dredging in Schuylkill River.—U. S. Engrg. Office.

**B. C., North Arm.** noon, July 30.  
Dredging in Fraser River.—R. C. Desrochers, Secy., Dept. Pub. Wks., Ottawa, City Bldg.

**B. C., Powell River.** July 31.  
Addition to wharf and dredging.—E. Laflur, Dpt. Pub. Wks., Engr.

**Hawaii, Honolulu.** 11 a. m., Aug. 26.  
Dredging in Honolulu harbor.—U. S. Engrg. Office, 401 Custom House, San Francisco.

## STREETS AND ROADS.

**Ala., Albany.**—Work will be started shortly on paving; estimate, \$300,000. Address City Clk.

**Ark., Forrest City.**—Bids will be received in about one month for gravel roads in St. Francis Co.; estimate, \$160,000. Address L. C. Torrence, Engr., Forrest City.

**Ark., Lonoke.**—An issue of \$175,000 5½ per cent, 20-year Road Dist. No. 10 bonds sold.

**Ark., Pine Bluff.**—Following an agreement in Road Impvt. Dist. No. 14, it is expected that contract for construction of about 52 mi. of highway in this district soon to be awarded. Instead of building one road this district will have a network of roads.

**Cal., Alturas (Modoc Co.).**—Returns from all parts of county indicate that bond issue of \$400,000 for county highways carried here.

**Cal., Marysville (Yuba Co.).**—Supervisors here transferred \$60,000 of county money into new fund which is to be used solely for building permanent roads. The action is in line with decision of the Board to build five mi. of permanent road every year, and this appropriation marks the creation of the fund.

**Cal., National City.**—Will probably vote on \$125,000 street improvement bonds.

**Cal., Red Bluff.**—County officials gave out statement that county bond issue of \$816,000 for construction of court house here, and roads and bridges throughout county, had carried at election.

**Cal., Sacramento.**—Street improvements by city for next year in amount of \$126,556 will be recommended by Comr. of Streets D. W. Carmichael. The streets are those already accepted by the city as permanently improved, but which have become so badly worn that repair must be made. In addition, Carmichael will recommend reduction of the grades between X and Y Sts., from 21st to 30th, at cost of \$26,271.

**Cal., Sacramento.**—Two new state roads projects have been opened for bids by California State Hwy. Comm. One in-

volves 2.8 mi. of grading in Humboldt Co. Engineer's estimate is \$32,465.50, the State furnishing reinforced steel, corrugated metal pipe and Portland cement cost \$3,417.74. The lowest bid is by J. Wilmshurst, of San Francisco, at \$39,976.50. The other grading is between Last Chance Slide and Cushion Creek, in Del Norte Co., approximately 7.9 mi. in length. Engineers' estimate for this piece of work is \$204,737.30. Palmer and McBride present lowest bid, \$199,840.10, while Warren A. Bechtel, also of San Francisco, bids \$220,553.

**Cal., San Francisco.**—\$40,000,000 bond issue for highways has been carried by the state. This is irrespective of issues already voted by counties.

**Cal., Santa Rosa (Sonoma Co.).**—Sonoma Co.'s \$1,640,000 highway bond issue was sold.

**Cal., Tulare.**—Tentative plans have been submitted to City Council calling for paving of forty blocks of residence and business district streets. All members of Council are committed to the plan in principle, discussion at present time being in relation to proper method of financing the work.

**Fla., Daytona.**—Election will be ordered upon issuance of about \$425,000 of municipal bonds for paving streets; approximately 125,000 yds. of paving. C. M. Rogers, City Engr.

**Fla., Jacksonville.**—City will vote Aug. 5 on bond issue of \$100,000 for paving.

**Ga., Buchanan.**—Election held July 9 upon issuance of \$200,000 of bonds by Haralson Co. for constructing roads. Chmn., Bd. of Co. Comrs.

**Ga., Quitman.**—Issuance of \$500,000 of bonds by Brooks Co. for constructing roads was voted. Chmn., Bd. of Co. Comrs.

**Ga., Rome.**—Washington dispatches tell of proposed military road to be built through Rome by U. S. Govt. If certain legislation now pending becomes a law, survey of routes through Georgia provides for highway entering at Dalton, through Rome and thence to Atlanta and southeast to Brunswick. Another military highway would enter northeastern corner of state and pass through Gainesville to Atlanta and then on almost a straight line into Alabama. A third road would pass through Augusta and Savannah, and then down the coast to Brunswick.

**Ga., Sylvester.**—Voted \$400,000 road bonds, dated July 1, 1919. J. W. Warren, Clk., Superior Court.

**Ida., Lewiston.**—Bond issue for \$28,000 was voted by citizens of the Waha-Tammany highway district for completion of macadamized road from the Jap Mounce place to Lake Waha.

**Idaho, Troy.**—City voted \$125,000 bonds to build and improve roads here.

**Ida., Weiser.**—Work has begun by business men of city to have Co. Comrs. call bond issue of \$300,000 in near future for the building of new roads.

**Ill., Moline.**—Ordinances adopted for paving 37th and 12th Aves. Address City Clk.

**Ind., Columbia City.**—State Bd. of Tax Comrs. have approved bond issues for construction of three roads in Columbia, Union, and in Washington Twp.

**Ind., Indianapolis.**—Marion Co. proposes to spend \$4,000,000 on highway improvements. Bids will be opened this month on roads in Washington Twp., costing \$138,535; in Center Twp., \$50,272; in Wayne, \$71,850; in Decatur, \$57,356. Roads have also been petitioned in Center Twp., at cost of \$168,464; Franklin Twp., \$83,300, and Washington Twp., at cost of \$94,942.

**Ind., Indianapolis.**—State Bd. of Tax Comrs. approved various petitions for bonds, totaling \$43,600 for roads.

**Ind., Indianapolis.**—Resolutions have been adopted for improvement of eighteen streets.

**Ind., Laporte.**—Bd. of Pub. Wks. passed resolution to have sidewalks. The paving of Jefferson Ave. will cost well over \$50,000. Clerk will advertise for bids on the work.

**Ind., Portland.**—Jay Co. received bids July 14 on \$53,400 bonds for highway improvements.

**Ia., Eavenport.**—14th St., from east line of Brady St. to the east line of Carey Ave., to be resurfaced with asphaltic concrete or bitulithic on old present brick foundation. Estimated cost, including intersections, \$44,550.59. Also the following streets to be improved by excavating, grading, curbing and paving: Fairfield St., 1,703 lin. ft.; estimated cost, including intersections, \$18,665.01; Park Lane, 1,114 lin. ft.; estimated cost, including intersections, \$16,699.30; Eola St., 441 lin. ft.; estimated cost, including

intersections, \$4,302.63; Myrtle St., about 392 lin. ft.; estimated cost, including intersections, \$4,540.30; alley between Charlotte Ave. and 6th St. with Portland cement concrete 6 in. thick; estimated cost, \$3,898.70.

**Ia., Des Moines**—Plans in progress for grading 14th St., from Grand to Locust St. Estimate, \$75,000. Frank Jeffries, Clk.

**Ia., Mason City**—Carried at election \$750,000 road bonds. Geo. E. Frost, Co. Aud.

**Ia., Spencer**—Election in Clay Co., July 22, on \$800,000 bonds for hard surfacing roads. Address Co. Clk.

**Kan., Hutchinson**—City has sold bond issue of \$900,000, to be used for roads.

**Mass., Lowell**—Plan has been adopted by city, county and state to widen 1st St. for length of 1,000 ft., from which point a state road will be constructed which will connect with state highway at Lowell-Dracut line.

**Mich., Blissfield**—Issue of \$48,000 bonds voted for road improvements. Address Village Clk.

**Mich., Port Huron**—An election was held June 28 to vote on issuing paving bonds to amount of \$100,000.

**Minn., Duluth**—The biggest job ordered by City Comrs. was paving of Railroad St., from Seventeenth Ave. W. to Garfield Ave. at cost of \$83,113.25. The pavement will be 30 ft. wide and of brick. First reading was given ordinance appropriating \$37,261.37 from permanent improvement fund as city's share in East 3d St. paving job.

**Minn., Duluth**—St. Louis Co. voted for issuance of \$7,500,000 bonds for construction of approximately 270 mi. of roads under Babcock plan, at recent special election.

**Minn., Duluth**—With the hope that bids can be prepared and let this coming autumn Co. Rd. Engr. R. W. Acton is speeding the completion of plans for hard-surfacing of Miller Trunk Rd. Paving is to be 18 ft. wide. The approximate cost now estimated is \$1,500,000.

**Minn., Duluth**—City Council adopted Comr. J. A. Farrell's resolution for paving Railroad St. There will be brick roadway 30 ft. wide and cost has been estimated at \$83,113.25.

**Minn., Grand Rapids**—Itasca Co. will vote Aug. 18 on bond issue of \$2,000,000 to build paved road.

**Minn., Minneapolis**—Bids, July 9. \$1,057,791.85 street improvement bonds. Dan C. Brown, City Compr.

**Minn., Moorhead**—A comprehensive system of paved streets, covering 101 blocks, and  $8\frac{1}{2}$  mi., was adopted by City Council. Plans of Council provide for paving of 6th St. S., Seventh and Eighth Aves. S., the improvement of approaches to the two river bridges, and the graveling of 9th St. N. this year also if possible.

**Miss., Columbia**—Issuance of \$200,000 road construction bonds by Marion Co. was voted. Chmn., Bd. of Co. Comrs.

**Miss., Mendenhall**—Bd. of Supvrs. of Simpson Co. will issue \$165,000 bonds for building roads in Southwestern district. J. B. Bishop, Secy., Pinola, Miss.

**Mont., Big Timber**—Sweetgrass Co. election Sept. 2 to vote on \$125,000 bonds to build roads. D. J. Walwoord, Big Timber, Engr.

**Mont., Broadus**—Powder River Co. election Sept. 2 to vote on \$150,000 bonds to build roads. F. L. Funkenbusch, Broadus, Engr.

**Mont., Chinook**—Blaine Co. election Sept. 2 to vote on \$100,000 bonds to build roads. C. R. Hanke, Chinook, Engr.

**Mont., Choteau**—Teton Co. election Sept. 2 to vote on \$150,000 bonds to build roads. F. Daly, Choteau, Engr.

**Mont., Columbus**—Stillwater Co. election Sept. 2 to vote on \$163,000 bonds to build roads. G. N. Cardoza, Columbus, Engr.

**Mont., Forsyth**—Rosebud Co. election Sept. 2 to vote on \$100,000 bonds to build roads. P. D. Pratt, care State Highway Dept., Helena, Engr.

**Mont., Harlowton**—Wheatland Co. election Sept. 2 to vote on \$200,000 bonds to build roads. C. C. Jewell, Harlowton, Engr.

**Mont., Harve**—Hill Co. election Sept. 2 to vote on \$150,000 bonds to build roads. J. E. Peterson, Harve, Engr.

**Mont., Havre**—Hill Co. Authorized by Co. Comrs., \$150,000 highway bonds. John H. Devind, Clk.

**Mont., Laurel**—City Council has passed resolution of intention to create special improvement district to pave Main St. The proposed paving is to be 20 ft. wide and half a mi. long. Cost is estimated at \$41,500. The work is to be done on plans prepared by State Hwy. Comn.

**Mont., Missoula**—Voters of Missoula Co. will be asked to bond Co. in sum of \$250,000 for building good roads throughout this county, a resolution formally adopted recently by executive committee.

**Mont., Shelby**—Toole Co. election Sept. 2 to vote on \$200,000 bonds to build roads. H. E. Rawson, Shelby, Engr.

**Mont., Virginia City**—Madison Co. election Sept. 2 to vote on \$150,000 bonds to build roads. C. C. Adams, Virginia City, Engr.

**Mo., West Plain**—Sealed proposals will be received by W. W. Ellis, Co. Clk., until Aug. 6, for purchase of \$500,000 5 per cent road bonds.

**Nev., Carson City**—Comrs. Mineral Co. plan to build 10 mi. Walker Lake Rd. About \$148,000.

**Neb., Ogallala**—Road planned in Keith Co. Address Lulu Rosengrant, Co. Clk.

**Neb., Superior**—L. L. Carpenter, City Clk., soon lets contract paving 20 blocks streets, 25 ft. wide, involving 25,000 sq. yd. asphaltic concrete on 5-in. concrete base or alternate bids on 6-in. concrete, and \$15,000 lin. ft. concrete curb and gutter. About \$75,000. A. A. Cummins, Superior, Engr.

**N. J., Passaic**—Bergen Co. agrees to accept part responsibility for Hoboken Rd., East Rutherford and Carlstadt, the remainder. Paving expected to begin this year.

**N. Y., Brooklyn**—Bd. of Estimate authorized following local improvements in Brooklyn and Queens: Paving with asphalt (permanent pavement) East 14th St., distance of 180 ft. in southerly direction, and with preliminary pavement of bituminous macadam from Ave. L to point 180 ft. south of Ave. K; estimated cost, \$11,800. Regulating, grading and paving with asphalt (permanent pavement), E. 18th St., from Ave. O to P; estimated cost, \$15,400. Paving with asphalt (permanent pavement), 83d St., from 18th to 20th Aves.; estimated cost, \$11,100. Paving with asphalt (permanent pavement), 83d St., from Third to Fourth Ave.; estimated cost, \$10,000. Paving with asphalt (permanent pavement) and recurring where necessary, 77th St., from Thirteenth to Fourteenth Aves.; estimated cost, \$10,300. Paving with asphalt (permanent pavement) 86th St., from Twenty-second Ave. to Bay 37th St.; estimated cost, \$38,800. Paving with asphalt 63d St., from Fifth Ave. to Sixth Ave.; estimated cost, \$10,000. Regulating, grading and paving with asphalt (permanent pavement), Fourth Ave.; estimated cost, \$19,400. Paving with asphalt (permanent pavement) and curbing and recurring where necessary, Roiland St.; estimated cost, \$12,800.

**N. C., Asheville**—Greene Co. Court appropriated funds to extend pike road to Paint Rock. It means that road will be constructed from point near Paint Rock to Cove Springs Rd. across Paint Mountain, a distance of four or five mi., making physical connection between Dixie Hwy. and Memphis-Bristol-Washington Hwy.

**N. C., Asheville**—Comr. Sherrill asked sec. treas. to investigate the matter of issuing bonds for street improvements, and if his department still had any leeway, he wanted an issue sold in order that certain streets in the city could be paved soon.

**N. C., Charlotte**—Comrs. of Mecklenburg Co. will borrow \$500,000 and proceed to build roads that are needed in the county without waiting to vote for or against a million-dollar bond issue, if plans considered by Chamber of Commerce are carried out.

**N. C., Charlotte**—Proposal for issue of \$100,000 bonds to pay city's part of contemplated \$300,000 street and sidewalk paving project will be placed before people of Charlotte.

**N. C., Nashville**—City plans to pave  $1\frac{1}{4}$  mi. Washington Ave. and Depot St., 30 ft. wide. About \$50,000.

**N. C., Winston-Salem**—Total of \$20,000,000 is available for road construction in the state for this year, exclusive of State and Federal aid, according to figures compiled by North Carolina Good Roads Association. Amounts of money available in counties in southeastern section of the state are as follows: Bruns-

wick, \$35,000; Bladen, \$40,000; Columbus, \$50,000; Duplin, \$200,000; Onslow, \$270,000; Pender, \$160,000; Robeson, \$1,300,000.

**O., Cincinnati**—City Council passed ordinance providing for bond issue of \$49,500 for improvement of Central Ave.

**O., Columbus**—Bond issue of \$50,000 for street repairs has been proposed.

**O., Sandusky**—Bids will be received soon to tar two mi. of the macadam work already finished on the Columbus-Sandusky Rd.

**O., Wapakoneta**—Council has ordered paving of Benton and Bellefontaine Sts. at cost of \$46,000.

**Ore., Hood River**—The Lost Lake Rd. construction, which was undertaken the past winter by Hood River Co. Game Protective Association, is assured. The Co. crews, under supervision of Commissioner J. O. Hannum, are rushing work on a grade to the edge of the forestry reserve. The Forestry Dept. will build road through the reserve, connecting with county road.

**Ore., Ontario**—Bids for three mi. of hard-surface pavement were ordered called for by City Council. Plans call for paving of not only main business streets, but also for constructing arteries leading to the city limits on the north.

**Ore., Ontario**—City Council passed resolution authorizing three mi. of paving in Ontario, streets to be paved being Main or Oregon St. and all smaller business streets branching from that, also California Ave. Rd. leading to Snake River Bridge.

**Ore., Portland**—Bids are asked for improvement of about 20 streets.

**Ore., Roseburg**—Tiller-Crater Lake cut-off road was approved by Co. Court when they decided to co-operate with State and Federal Govt. on financing of proposed road. The estimated cost is \$65,600, which will be divided equally among the State, Federal and Co. governments.

**Ore., Salem**—Projects to be let at next meeting and estimated quantities follow: John Day Hwy., in Grant and Wheeler counties, between Fossil and Dayville: Unit No. 1, 13 mi., 91,000 cu. yds. excavation; Unit No. 2, 12.5 mi., 74,000 cu. yds. excavation; Unit No. 3, 12 mi., 91,000 cu. yds. excavation; Unit No. 4, 11.5 mi., 103,000 cu. yds. excavation; total, 49 mi., 359,000 cu. yds. excavation. Baker-Cornucopia Hwy., in Baker Co., Canyon section, 4.4 mi. of grading and graveling, 95,000 cu. yds. of excavation, 15,400 cu. yds. of gravel surfacing.

**Ore., The Dalles**—More than \$65,000 will be spent for paving here this summer and work will be started within the next few weeks on several streets of the city.

**Pa., Kittanning**—Armstrong Co. voted \$1,000,000 bonds to improve roads.

**Tenn., Bristol**—Bids will be accepted at office of B. E. Ballard, City Cl., for work to be done on Spencer St. Part of street is to be built with concrete base of four inches and two-inch surface of sheet lake asphalt, while other section will be constructed of water-bound macadam with an asphalt flush coat. A petition from property owners of vicinity of fair grounds was presented requesting that city repair Vance St. with macadam and sidewalks from Peters St. to corporate limits. Another petition from property owners on Portsmouth Ave. asked that street be graded and macadamized.

**Pa., Pittsburgh**—West Carson St. will be improved and widened from 50 to 60 ft.; expected cost, \$163,057.

**Tenn., Boone**—Rd. Comn. has bought and will improve the Boone and Blowing Rock Turnpike, and town officials are getting ready to build concrete sidewalks and streets, and a water system will be put in soon by a private corporation if present plans are carried out.

**Tenn., Newport**—It was announced that Cocke Co. had voted \$90,000 bond issue, with \$30,000 of amount directly specified to be used for improvement of Dixie Hwy., a distance of about ten or twelve mi., with additional amount of \$60,000, or as much as was needed, appropriated by Tennessee State Hwy. Comn.

**Tex., Burkburnett**—See "Sewerage."

**Tex., Denton**—The \$110,000 from street and sewer extension bonds were received by city.

**Tex., Glen Rose**—Road bond election in Road Precinct No. 1 of Soverevell Co. The amount voted is \$60,000, and state, through Hwy. Comm., agrees to supplement this amount with \$40,000 state money, making total of \$100,000 to be used on roads in three-fifths of the county and covering about 20 mi., including two or three bridges. The Co. Comrs. contemplate starting work in the near future.

**Tex., Houston**—City Council will meet to devise ways and means to raise funds to repair damage done to streets and sewers by recent heavy rains. Mayor Amerman said City probably would have to expend \$50,000 to put streets and sewers back in order. Washington Ave. for several blocks beyond Southern Pacific crossing will have to be repaved entirely. Damage was also done in many sections to gravel streets.

**Tex., Quannah**—At meeting of City Council it was decided to pave 3d St. from its intersection with Main St. to city limits. Paving will consist of concrete base covered with a sand cushion, over which will be laid fiber brick with asphalt as a filler.

**Tex., Ranger**—Sixty-four blocks of new paving for Ranger are included in paving plans adopted here. Paving will go forward as soon as bids can be advertised for and contracts let. Among districts which will be paved, all east of the Texas & Pacific Railway: Commerce St., Main St., Rusk St., Cypress St., Marston St., and probably Pine St. Oak St. will be the longest stretch.

**Tex., San Angelo**—Coke Co. voted in favor of \$60,000 road improvement bonds. The bond money is to be used to improve Coke Co. portion of the Del Rio-Canadian Hwy. State Hwy. Comm. has set aside \$63,000 state aid and \$20,000 federal aid to be used in connection with proceeds of bond issue.

**Tex., Trinity**—Election held at this place on question of issuing \$200,000 good road bonds in Dist. No. 2, Trinity Co., carried.

**Tex., Vernon**—City Comm. voted to pave 42 additional blocks of streets within the next few months. City officials are receiving estimates on material. Bids will be called for at early date.

**Tex., Weatherford**—Comm. received bids on paving streets of Weatherford, under the recent bond issue, but all bids were rejected as being too high. It is probable new bids will be requested about middle of this month.

**Va., Danville**—Council adopted resolution calling for an election for \$300,000 bond issue for street improvements on Aug. 5.

**Wash., Bellingham**—All bids received for paving of Lynden-Glendale Rd., 5½ mi., have been rejected by Co. Comrs. Believed paving of the road will be postponed until next spring.

**Wash., Spokane**—Contract for purchase of approximately \$400,000 worth of road bonds of Lincoln Co. was made at Davenport recently by investment banking houses of Murphey, Favre & Co., Ferris & Hardgrove and the Union Trust Co. Co. Comrs. of Lincoln Co. have mapped out splendid plan of road improvements and have approved six road districts.

**Wash., Waterville**—Will shortly offer \$375,000 5½ per cent 20-year road bonds.

**W. Va., Glenville**—It is planned to expend about \$26,000 for grading and draining 2 mi. of road in Gilmer Co. Address Co. Rd. Engr.

**W. Va., Morgantown**—Monongalia Co., Grant Dist., voted \$325,000 bonds to build 19 mi. roads, vitrified brick. L. Cox, Morgantown, Engr.

**W. Va., Moundsville**—Surveys being made for roads in Washington and Clay Dist., Marshall Co. Address Co. Rd. Engr.

**W. Va., Pineville**—Comrs. Wyoming Co. plan election soon to vote on \$94,000 bonds to grade 4 mi. Elmore-Herdon Rd.

**W. Va., Wayne**—An issue of \$980,000 road bonds was awarded to State of West Virginia.

**Wis., Whitewater**—Second Ward Savings Bank has been awarded \$15,000 street improvement bonds.

**Wyo., Caspar**—City has sold bonds of \$49,000 for street paving intersections.

**Alt., Edmonton**—Repairs to Jasper Ave., estimated at \$200,000, is proposed by City Council.

**Ont., Owen Sound**—Town Council plans to expend \$300,000 to build roads. D. H. Fleming, Town Engr.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Ariz., Bisbee**—City let contract for 40,000 sq. yd. concrete paving, ¾-in. thick, with wearing surface, cement curbs and walks, to F. V. McPeak, 2415 Gramercy Park, Los Angeles, Cal. About \$105,000.

**Ida., Caldwell**—Work on paving will be delayed, but the Warren Construction Co., which was awarded that portion of the city improvement program for \$193,812.24, at rate of \$2.42 per sq. yd., indicated they would be ready to begin paving operations as soon as sewer work would permit.

**Ind., Brownstown**—Contracts for construction of three concrete roads in Jackson Twp., Jackson Co., have been disposed of as follows: Seymour and Dudleytown Rd., to Davis Construction Co., Tipton, Ind., at \$48,450; Seymour and Four Corners Rd., matter continued, Davis Construction Co., Tipton, Ind., low bidder; Seymour and Brownstown Rd., to Kattman & Hancock, Brownstown, Ind., at \$49,975.

**Ind., Brownstown**—Following bids received for four mi. concrete paving in Jackson Co. Kattman & Hancock, of Brownstown, \$49,975; Davis Construction Co., of Tipton, \$48,450.

**Ind., Corydon**—Contracts for construction of stone roads in Harrison Co. have been let as follows: John J. Seipel Rd., at \$25,293, to C. J. Treece, Elizabeth, Ind.; Sam P. McKee Rd., at \$12,969, to C. J. Treece.

**Ind., Indianapolis**—Contracts for construction of 13,425-ft. macadam road in Fugit Twp., Decatur Co., has been let at \$17,950, to Avery, Weintraut & Beagle, Shelbyville, Ind. Contract for construction of 14,430 ft. concrete road in Washington Twp., Decatur Co., has been awarded at \$89,096, to Foulkes Contracting Co., Terre Haute, Ind. Contract for construction of 13,335 ft. macadam road in Adams Twp., Decatur Co., has been let at \$17,475, to Thomson & Davis, Greensburg, Ind.

**Ind., Indianapolis**—Contract for construction of concrete road in Penn Twp., Jay Co., has been let at \$27,690, to Swihler & Davis, Portland, Ind. Contract for construction of 4,920-ft. concrete road in same township was let at \$38,782 to same firm.

**Ind., Indianapolis**—Contract for construction of gravel road in Center Twp., Marshall Co., has been let at \$32,775 to A. W. O'Keefe, Plymouth, Ind.

**Cal., Sacramento**—The following bids were received by the State Highway Commission on June 23 for the construction of a state highway in Lake County, Division I, Route 16, Section A, Federal Aid Project No. 20: Engineer's estimate, \$98,140.90; lowest bidder, A. J. Fairbanks, Willits, \$131,790.10; highest bidder, Bates & Borland, Oakland, \$184,066.00; Erickson & Petterson, San Francisco, \$135,200.20; F. Rolandi, San Francisco, \$145,831.60; Grant, Smith & Co., Spokane, Wash., \$139,519.60; Conners, Green & Co., Castella, \$171,692.00. The materials furnished by the state are reinforcing steel, portland cement and corrugated metal pipe—\$9,881.55. The unit prices are given for the engineer's estimate (E), the lowest bid (L) and the highest bid (H):

Items	Quantities	(E)	(L)	(H)
Excavation without classification.....	104,600 cu. yds.	\$0.80	\$1.12	\$1.52
Portland cement concrete (culverts and mons.), Class "A".....	300 cu. yds.	25.00	24.00	40.00
12-in. corrugated metal pipe.....	3,104 lin. ft.	1.00	.90	2.00
15-in. corrugated metal pipe.....	956 lin. ft.	1.15	1.00	2.50
18-in. corrugated metal pipe.....	830 lin. ft.	1.25	1.25	2.50
24-in. corrugated metal pipe.....	64 lin. ft.	1.50	1.75	3.00
30-in. corrugated Metal pipe.....	34 lin. ft.	2.00	1.50	3.50
Moving and resetting property fences....	4 miles	300.00	480.00	300.00
Monuments .....	356 each	1.00	1.50	2.50

**Cal., Sacramento**—The following bids were received by the State Highway Commission on June 23 for constructing a state highway in Mendocino County, Division I, Route 16, Section A, Federal Aid Project No. 19: Engineer's estimate, \$100,349.20; highest bid, W. J. Schmidt, Berkeley, \$173,608.00; lowest bid, J. P. Holland, San Francisco, \$119,751.80; Erickson & Petterson, San Francisco, \$162,891.50; Bates & Borland, Oakland, \$160,566.00; F. Rolandi, \$144,216.50; Chas. D. Soteras, Los Angeles, \$141,836.50; A. J. Fairbanks, Willits, \$133,668.00; Conners, Green & Co., Castella, \$163,282.00. The materials furnished by the state are reinforcing steel, portland cement, corrugated metal pipe—\$8,148.98. The unit prices are given for the engineer's estimate (E), the highest bid (H) and the lowest bid (L):

Items	Quantities	(E)	(L)	(H)
Excavation without classification.....	106,800 cu. yds.	\$0.80	\$0.98½	\$1.43
Portland cement concrete (culverts and mons.), Class "A".....	350 cu. yds.	25.00	25.00	30.00
12-in. corrugated metal pipe.....	1,846 lin. ft.	1.00	1.00	2.00
15-in. corrugated metal pipe.....	1,248 lin. ft.	1.15	1.10	2.00
18-in. corrugated metal pipe.....	480 lin. ft.	1.25	1.50	3.00
24-in. corrugated metal pipe.....	104 lin. ft.	1.50	1.75	3.00
Moving and resetting property fences....	6 miles	300.00	200.00	300.00
Monuments .....	322 each	1.00	1.50	2.00

**Ind., Lebanon**—Contracts for construction of gravel roads in Boone Co. were let as follows: Randall Rd., in Jefferson Twp., to J. M. Crawford, Lebanon, Ind., at \$19,850; Small Rd., in Center Twp., to B. J. Moore, Lebanon, Ind., at \$11,190.

**Ind., Rensselaer**—Contract for construction of stone road in Newton Twp., Jasper Co., has been let at \$10,470, to Ben D. McColly, Rensselaer, Ind.

**Ind., Rochester**—Contract for construction of brick road in Rochester Twp., Fulton Co., has been let at \$26,900, to Hugh B. Holman, Rochester, Ind.

**Ind., Shoals**—Contract for completion of road in Mitchelltree Twp., Martin Co., has been let at \$17,000 to W. T. Johnson, Indian Springs, Ind.

**La., Des Moines**—Bids for Forest Ave. Viaduct were received by City Council and referred to Dept. of Streets. Alexander and Higbee were low with bid of \$17,459, and George F. Lambert, with \$28,750, held the top position. The viaduct will be constructed on Forest Ave. near 35th St.

**La., Des Moines**—The City Council voted to pave 19th St. Pl., from Cottage Grove to Olive Ave., and let contract to J. L. Lytton for concrete paving at \$2.72 a yard.

**La., Slou City**—Paving bids of \$2.74 to \$2.76½ were accepted at meeting of city council. C. M. Jensen was awarded contract for the paving of 31st St., between Jackson and Jennings Sts., and 30th St., between Nebraska and Jones Sts. S. J. Krage was awarded the contract to pave Peters Ave. and Slou Trail and Plymouth St., between 6th and 11th Sts.

**La., Alexandria**—City Council has let contracts for paving with brick of three mi. of streets in Alexandria, to Jack Valeant, at the price of \$3.55 per sq. yd. The contract for paving with gravel of a mile and a half of streets was awarded to C. E. Ransbottom at \$1.20 per sq. yd. The concrete street paving and sidewalk work was awarded Hudson Construction Co. The total street paving will amount to about \$256,000 and the sidewalk work to \$40,000.

**Kan., Fort Riley**—The Kaw Paving Co., of Topeka, was low bidder on 65,000 sq. yd. of asphaltic resurfacing at Fort Riley, their bid of \$1.60 a sq. yd. totaling \$104,000.

**La., New Orleans**—Contract for roads in Jefferson Parish awarded by State Highway Dept., to Paxton Miller, New Orleans, at \$89,035.

**Mass., Boston**—Contract for surfacing road in Quincy, Weymouth, Hingham and Cohasset awarded to E. C. Sargent, Quincy, at \$31,407.50.

**Mo., Kansas City**—Ordinance confirming contract to pave Warwick Traffic

Way from 27th to Main St. was referred in lower house to the Streets, Alleys and Grades Committee. Contract, which was awarded to James O'Connor & Son, provides for laying of an 8-in. concrete pavement. There are 13,230 sq. yds. in the job; contract price is \$2.48 a sq. yd. The part of Warwick Triffic Way to be paved begins at 27th St. and runs south past Union Cemetery to 29th St., where it turns east to Main St.

**New Mexico**—State Hwy. Comn., Santa Fe, let contract building 12 mi. Federal Aid Project No. 15, from Las Cruces to Mesquite, Dona Ana Co., to Lee Moor Constr. Co., 312 Two Republic Bldg., El Paso, Tex. About \$300,000.

**\*N. J., Passaic**—Contract for second section of Bergen Turnpike was awarded John T. Harrop Co., at bid of \$38,386. Road runs from Hackensack River to Little Ferry.

**\*N. J., Woodbridge**—Contract awarded East Jersey Bridge Co., Inc., Perth Amboy, N. J., for paving Green St. and Rahway Ave., total of 10,232 sq. yds., 5x12x2-in. Hastings asphalt blocks, for \$21,180.24.

**\*O., Canton**—Contracts were awarded as follows: Massillon-Orrville, 1.21 mi., Glen Hadley, \$45,710.40; Beach City-Strasburg, .51 mi., Hahn Construction Co., \$19,889.45; Canton-Middlebranch, 1.44 mi., Wise Brothers, \$51,469.50; Louisville-Freeburg, 1.53 mi., Sec. D, to Elmer Vogt, \$61,108.91, and Sec. C, to John Wilson, \$29,292.80; Alliance-Minerva, 1.42 mi., Elmer Vogt, \$58,908.10; Navarre Village, .75 mi., Elmer Vogt, \$42,910.77.

**\*O., Dayton**—Contract for paving of 3d St., between Perry and St. Clair St., awarded to Contractor E. D. Murray at his bid of \$93,304.

**\*Pa., Johnstown**—Contract for engineering work on nearly two mi. of additional road work was let by Summerhill Twp. Supvrs. to Owen & Plummer, Inc., Johnstown engineering firm, with offices in the Otto Bldg.

**Pa., Harrisburg**—Only one contractor put in bid at City Council for paving of street sections. Central Construction Corporation was only firm to bid, and, according to their proposals, the paving of street sections with asphalt will cost \$3.32 to \$3.36 a sq. yd., and granite curbing will cost \$1.60 to \$1.63 a lin. ft. Bitulithic paving will cost \$3.20 a sq. yd.

**\*Pa., Parsons**—Contract awarded O'Brien Bros., Avoca, Pa., for paving 9,800 sq. yds. 5x12x2-in. Hastings asphalt blocks, for \$22,834.

**\*S. D., Parkston**—Ellerman & McLain, Yankton, S. D., awarded contract for 6½ mi. of 8 to 18-in. sewer, with necessary appurtenances, at \$59,573.

**Tex., Jasper**—Comrs. Jasper Co. received lowest three bids grading and gravel surfacing 16.21 mi. Highway No. 7, from Jasper, west to county line, 12 ft. wide, from Smith Bros. & Bland, Jasper, \$122,046; Allhand & Davis, Willis Point, \$127,467; J. S. Moore, Lufkin, \$131,077.

**\*Wash., Kelso**—Contract for surfacing five mi. of Pacific Hwy., from Martins Bluff to Woodland, in Cowlitz Co., was let by Washington Hwy. Bd. to D. A. Williams, of Tacoma, at contract price of \$34,038. Engineer's estimate for this piece of work was \$36,600. Grading of this section of highway is now in progress.

**\*Wash., Montesano**—Contract for paving Olympic Hwy. section was let to Harold Blake Contracting Co. The bid was one of the best and lowest submitted this year in the state, and was for \$80,000. It calls for pavement 18 ft. wide, 3.2 mi. long, of one-course concrete.

**\*Wash., Seattle**—S. A. Moceri, 1515 W. Barrett St., of this city, has been awarded contract for paving S. 56th St., from Union Ave. to Northern Pacific tracks in Tacoma, on bid of \$7,000.

**\*Wash., Seattle**—Contract for paving of Thorndyke Ave. and other streets on Magnolia Bluff, together with sewers and sidewalk work, was let to Kaiser Paving Co. by Bd. of Pub. Wks. at special meeting. Improvement will cost \$150,000.

**Wash., Vancouver**—Bids were opened by Co. Comrs. of Clarke Co., Wash., for paving 4½ mi. of Hazel Dell-Felida Rd. The following contractors submitted bids for one-course concrete: The Foundation Co., \$108,957.20; H. J. Kaiser Paving Co., \$115,757.86; Puget Sound Bridge & Dredging Co., \$119,118.10. The low bid was at the rate of \$2.35 per yd. For gravel

bitulithic; Warren Construction Co., \$110,283; Pacific Bridge Co., \$114,356.73. The low bid was at the rate of \$2.40 per yd. The Comrs. awarded contract to the Warren Construction Co. for gravel bitulithic.

## SEWERAGE AND SANITATION

**Cal., Willows (Glenn Co.)**—Citizens of Willows are voting on proposition of bond issue of \$40,000 for installation of sewer system here.

**Fla., Jacksonville**—City will vote Aug. 5 for sewer bonds of \$200,000.

**Ga., Cartersville**—Issuance of \$90,000 of municipal sewer construction bonds was voted. The Mayor.

**Ga., Summerville**—Issuance of \$15,000 municipal bonds for constructing sewer system voted. The Mayor.

**Mass., Boston**—Comr. of Pub. Wks. intends to construct several sewers at total cost of \$23,149.

**Mass., Newton**—City of Newton has awarded \$90,000 4¼ per cent sewer bonds to The Newton Trust Co.

**Mass., Quincy**—City have asked bids on bond issues of \$25,000 and \$30,000 for drainage and sewers.

**Mass., Reading**—It is proposed to expend \$40,000 for additional sewers. Address chairman of Sewer Commission.

**Mo., Boonville**—City will vote July 28, on bond issue of \$11,000 for sewers.

**N. J., Pleasantville**—Sewage system; \$150,000. Engr. Remington & Vosbury, Court House Bldg., Camden, N. J. N. Anderson Clk., City Hall. Drawing plans; will soon take bids.

**N. J., Westmont**—A sanitary sewer is to be constructed. Address Clk. of Twp. Committee, Seacaucus, N. J.

**N. Y., Brooklyn**—These are local improvements authorized by Bd. for Queens Borough: Sewer in Arlington Ave. and temporary connection at Woodside Ave.; estimated cost, \$4,200; sewer in Herald Ave., about 315 ft.; estimated cost, \$2,100; sewers in Haydock St. and in Franconia Ave.; estimated cost, \$6,200.

**O., Ironton**—City Council determines to construct sewers in 10th and Oak Sts.

**O., Lima**—Council has passed ordinance for construction of \$275,000 sewer in South Lima. Vaughn Miller, City Engr.

**Okla., Enid**—City will vote on \$175,000 bond issue for sewage disposal plant.

**Pa., Wilkes-Barre**—An ordinance has been passed authorizing 5% J. & J. Sewer bonds to the amount of \$80,000.

**S. D., Aberdeen**—Bond issue of \$325,000 for sewers has been purchased.

**Cal., Sacramento**—The following bids were received by the State Highway Commission on June 30 for the construction of a state highway in Humboldt County, Division I, Route I, Section J, Federal Aid Project No. 16: Engineer's estimate, \$32,465.50; lowest bid, J. Wilmshurst, San Francisco, \$39,976.50; highest bid, T. M. Olney, Oakland, \$63,129.50; Mercer-Fraser Co., Eureka, \$41,759.80; Connors, Green & Co., Eureka, \$55,644.70; A. J. Fairbanks, Willits, \$54,794.00; Pacific States Construction Co., San Francisco, \$59,365.80. The materials furnished by the state are reinforcing steel, corrugated metal pipe and portland cement—\$3,417.74. The unit prices are given for the engineer's estimate (E), the lowest bid (L) and the highest bid (H):

Items	Quantities	(E)	(L)	(H)
Excavation without classification.....	38,610 cu. yds.	\$0.75	\$0.95	\$1.50
Portland cement concrete (culverts and mons.), Class "A".....	65 cu. yds.	20.00	21.00	30.00
12-in. corrugated metal pipe.....	1,772 lin. ft.	1.00	.75	1.50
18-in. corrugated metal pipe.....	210 lin. ft.	1.25	1.00	1.75
24-in. corrugated metal pipe.....	34 lin. ft.	1.75	1.50	2.00
Monuments, hauling and setting.....	114 each	1.00	3.00	1.50

**Cal., Sacramento**—The following bids were received by the State Highway Commission on June 30 for the construction of a state highway in Del Norte County, Division I, Route I, Section B, Federal Aid Project No. 17: Engineer's estimate, \$204,737.30; lowest bid, Palmer & McBryde, San Francisco, \$139,840.10; highest bid, Erickson & Peterson, San Francisco, \$355,659.00; F. Rolandi, San Francisco, \$308,903.00; Connors, Green & Co., Eureka, \$320,452.25; Augustus J. Fairbanks, Willits, \$236,207.00; Warren A. Bechtel, San Francisco, \$220,553.00. The materials furnished by the state are reinforcing steel, corrugated metal pipe and portland cement—\$12,657.10. The unit prices are given for the engineer's estimate (E), the lowest bid (L) and the highest bid (H):

Items	Quantities	(E)	(L)	(H)
Excavation without classification.....	236,400 cu. yds.	\$0.80	\$0.77	\$1.42
Portland cement concrete (culverts and mons.), Class "A".....	380 cu. yds.	25.00	30.00	30.00
12-in. corrugated metal pipe.....	1,270 lin. ft.	1.00	1.00	1.25
15-in. corrugated metal pipe.....	2,182 lin. ft.	1.15	1.10	1.50
18-in. corrugated metal pipe.....	956 lin. ft.	1.25	1.40	1.75
24-in. corrugated metal pipe.....	340 lin. ft.	1.50	1.60	2.00
36-in. corrugated metal pipe.....	90 lin. ft.	2.00	2.00	2.50
Monuments, hauling and setting.....	453 each	1.00	1.50	2.50

**S. D., Artesian**—Carried at election \$35,000 sewer bonds.

**Tex., Burkburnett**—Mass meetings have been held for purpose of organizing and co-operating in effort to improve sanitary and other civic conditions; work will begin soon on sanitary sewer system. City officials also are planning to begin paving principal streets of city at early date.

**W. Va., Martinsburg**—John H. Zirkle, City Recorder, announces that \$100,000 sewer bond issue voted on July 7 was carried.

**Wyo., Caspar**—City has obtained security for \$60,000 bonds for sewer construction.

## BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**\*Ala., Century**—Sewer system to cost \$10,000 or more will be constructed by Alger-Sullivan Lumber Co.

## WATER SUPPLY

**Ark., Helena**—Water works improvements will soon be undertaken, according to plans now being made. Address Town Clk.

**Cal., Tracy**—City voted \$15,000 bonds to build water and sewer extensions.

**Colo., New Raymer**—A bond issue of \$20,000 for water supply system has been voted. Address Town Clk.

**D. C., Washington**—Plans being made for complete reorganization of water system. J. S. Garland, Supt. of Water Dept.

**Fla., West Palm Beach**—City having plans prepared by G. Simmons, Jr., care State Bd. Health, Jacksonville, building filtration plant. About \$75,000.

**Ga., Summerville**—Citizens voted bond issue of \$15,000 for water works and sewerage.

**Ida., Clinton**—City contemplates election for waterworks plant bonds. City Atty., Emmett P. Delaney. Mr. Corson, Mayor.

**Ind., Griffith**—State Bd. of Tax. Comrs. approved bond issue of \$26,000 for water works.

**Ida., Patron**—Bond issue of \$16,000 has been voted for a water works system. F. A. Taylor, Town Clk.

**Kan., Caldwell**—Water works improvements: \$75,000. Burns & McDonnell, 400 Inter-State Bldg., K. C., Mo. N. W. Baker, City Clk., Caldwell. Bond vote July 14.

**Kan., Phillipsburg**—W. N. McElvain, City Clk., advises that sealed proposals will be received by him until Aug. 19, for purchase of \$30,000 water works bonds.

**Mich., Bessemer**—This city will have improvements on waterworks and trees which will cost \$275,000.

**Mich., Port Huron Twp.**—Voted June 28 on \$100,000 water extension bonds.

**Minn., Elk River**—Election held June 24 resulted in favor of issuing following 5 per cent 20-yr. bonds: Water works, \$32,000; funding, \$8,000. They will be sold about Aug. 4.

**Minn., St. Paul**—Will not offer until about September the issue of \$100,000 4½ per cent 30-year water bonds recently authorized. Jesse Foote, Comptroller.

**Mont., Missoula**—Improvements which will take six months to complete and which will cost \$80,000 have been started at Bonner Dam, of the Missoula Light & Water Co.

**Mont., Townsend**—Town Council called special election for July 3 to vote on proposed bond issue of \$30,000 for improving local water supply.

**Mo., Boonville**—City will vote July 28, on bond issue of \$45,000 for water works improvement.

**Mo., Maryville**—Filtration plant; \$50,000. Engr., E. E. Harper, 2408 E. 30th St. E. D. Hewitt, City Clk. Bonds voted.

**Neb., Chadron**—Election will be held July 22 to vote on water works bonds to amount of \$102,000.

**Neb., Indianola**—Bond issue of \$32,000 for water works carried at recent election. Address Sydney Smith, City Clk.

**N. J., Woodbury**—City Council has authorized issuance of water bonds to amount of \$30,000.

**N. Y., Malone**—Election June 27 authorized water extension bonds to amount of \$30,000.

**N. D., Valley City**—Water mains are to be extended to Victory Park addition. Address Supt. of Water Wks.

**Okla., Chelsea**—A recent election authorized water and light bonds to amount of \$30,000.

**Okla., Comanche**—A \$35,000 bond issue has been voted for water and electric plant. The Mayor.

**Okla., Drumwright**—Plans are now ready for water works and other improvements for which city voted bond issue of \$435,000.

**Okla., Enid**—City Comrs. propose bond issue of \$300,000 for water works.

**Okla., Okmulgee**—Bond issue of \$200,000 for water works extension has been voted.

**Okla., Shawnee**—City will soon vote on \$250,000 bond issue for water works improvements.

**S. C., Chester**—Vote will soon be called for on bond issue of \$17,000 for water works extension.

**S. C., Orangeburg**—City plans election to vote on \$100,000 bonds to lay 4.1 mi. water mains in various streets. J. W. Hawes, City Engr.

**S. D., Wessington Springs**—Commercial club has recommended City Council that two reservoirs be constructed and water main extensions be made. Est., \$30,000.

**Tenn., Bristol**—Filtration plant and reservoir are to be constructed in the near future. Address City Engr.

**Tex., Terrell**—Bonds will be voted on this summer for \$100,000 for construction of surface lake near city and improvement of water system.

**W. Va., Martinsburg**—Rosemont Co. plans water works for suburban project. Address George M. Bowers, Pres.

**Wyo., Caspar**—City has obtained security for \$260,000 bonds for water works.

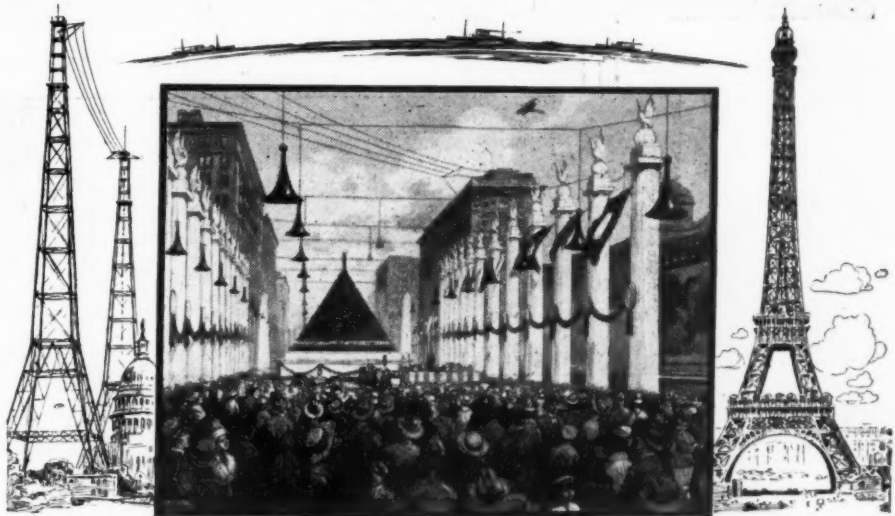
**Wash., Moose Jaw**—Expenditure of \$1,650,000 for new water system is contemplated.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

**\*Ida., Caldwell**—Work on replacing present system of wooden mains with cast iron pipe probably will not start for about three weeks, according to J. F. Forbes, of Caldwell, contractor, who was awarded contract for the work. Mr. Forbes' bid was \$27,825.70.

#### LIGHTING AND POWER

**Ala., Union Springs**—Arrangements have been completed by City Council for



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**Cal., Chico (Butte Co.)**—Chico will not purchase the electrical distributing system of the Pacific Gas and Electric Co. or the Northern California Power Co., but will build its own electrical distributing system and power plant. The Bd. took formal steps toward presenting question of bond issue to the people.

**Cal., Porterville**—City Council has under advisement plans for establishment of municipal electric light plant.

**Cal., San Francisco**—The Pacific Gas and Electric Company has under way plans for addition of 15 ft. to its dam at Lake Spaulding, one of the company's reservoirs near the summit of the Sierra Nevada. The addition, it is estimated,

will make the capacity 65,000 to 66,000 acre feet.

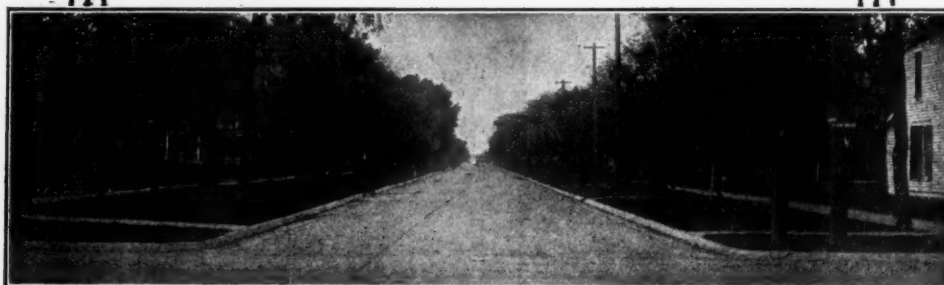
**Ga., Bowman**—A. E. Denny, Mayor, informs that on June 25 it was voted to issue \$10,000 5 per cent 30-year electric light bonds.

**Ill., Columbia**—Election to vote \$16,000 bonds to extend and improve the municipally owned light plant carried.

**Ia., Dubuque**—Dubuque City Council is considering holding special election for purpose of voting on municipal electric plant.

**Kan., Kansas City**—Election to vote \$500,000 bonds for extension of light and power plant at Quindaro to meet the increasing needs of the city. A new sub-station is also to be erected.

**Minn., Ely**—Council considered issuing \$66,000 bonds for improvements to mu-



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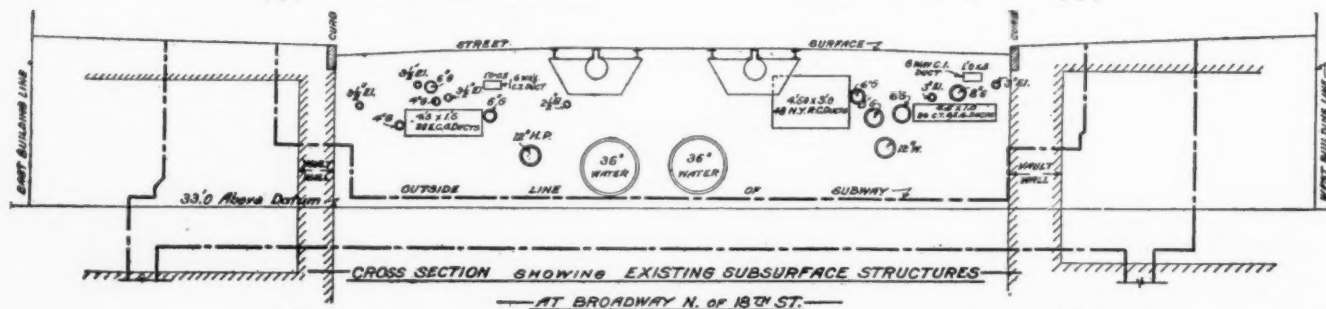
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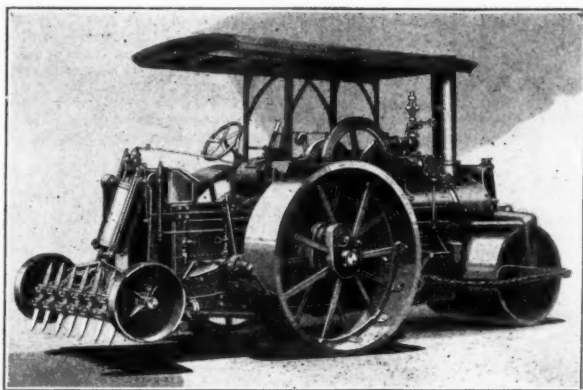
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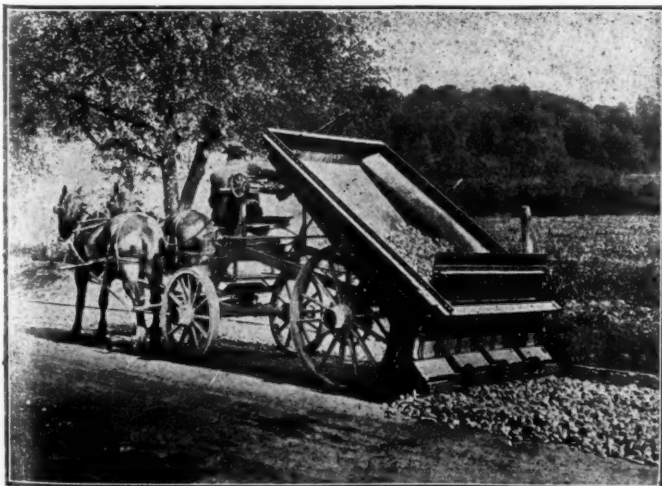
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**Minn., Hinckley**—\$30,000 light and water bonds have been authorized. A. J. Hunt, City Clk.

**Miss., Coldwater**—Issuance of \$10,000 municipal bonds for installing street lighting system has been voted. S. D. Wooten, Mayor.

**N. J., Clifton**—Town Council is understood to be considering plans for extensions in municipal electric street lighting system.

**N. Y., Rochester**—Bd. of Contract and Supply has completed arrangements for installation of new electric street lighting system in Oxford St. Hiram L. Davis is secretary.

**N. C., Murphy**—City Clerk E. C. Moore will receive sealed bids for issue of 6 per cent hydro-electric improvement bonds to amount of \$25,000.

**Pa., Damascus**—City has under consideration erection of an electric light plant.

**Tex., Sherman**—This city is making plans for a power and light plant which will cost about \$650,000.

**Wash., Seattle**—City Council makes appropriation of \$280,000 for additions to light and power system.

**Wis., Marshfield**—Council is planning ways and means to secure additional electric power. Address Mayor Kalsched.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**\*Ark., Springdale**—Contract awarded Frank Wilcox, St. Louis, Mo., by city, for construction of new electric light plant to be used for municipal service.

#### FIRE

**Ga., Columbus**—Bond issue of \$20,000 for new fire station has been made.

**Ia., Des Moines**—Bonds for \$100,000 have been voted to provide additional apparatus for fire department. Address the Chief.

**Ill., Hillsboro**—Purchase of new fire apparatus is considered. Address Chief of Fire Dept.

**Mass., Hyannis**—Purchase of new fire apparatus is being considered. Walter Chase, Clk. of Council.

**Mass., Marlboro**—Appropriation asked for motor apparatus.

**Mich., Houghton**—Committee appointed by council to report on apparatus needed by fire department. Village Trustees Smith, Hill and Rashleigh.

**Mich., Pontiac**—Included in the recently passed bond issues is \$75,000 for erection of third fire station, equipment and extensions of the fire alarm system.

**Minn., Hibbing**—The township is considering the purchase of a combination hose, chemical and pumping wagon which will be kept in Hibbing and be available anywhere in the township at all times.

**N. J., Pittman**—Considering purchasing of motor fire apparatus.

**N. J., South River**—Only one bid was received under recent proposal and it was decided to readvertise for bids on new fire motor engine.

**N. Y., Hornell**—Council plans to motorize entire department. Address the Chief.

**N. Y., New York**—Fire companies of Astoria, L. I., are to be motorized as soon as funds are available. Commissioner Drennan has announced.

**O., Kent**—It is proposed to install a siren fire alarm.

**O., Steubenville**—Council has been asked to provide additional fire protection for residential district on hilltops. City Solicitor C. I. Williams has been asked to arrange for bond issue to meet this condition.

**O., Struthers**—The question of issuing \$25,000 fire protection bonds will be submitted to vote.

**O., Struthers**—General plans for proposed fire system were approved at meeting of Council and Committee from Chamber of Commerce.

**Ore., Portland**—\$200,000 bonds have been voted for construction of 9 fire houses and two piers for fire boats.

**Pa., Allentown**—Bond issue of \$100,000 will be used to purchase new apparatus for the fire department. Address Chief of Dept.

**Pa., Camp Hill**—Planning to buy motor fire apparatus.

**Pa., East Pittsburgh**—Considering purchase of fire equipment.

**Pa., Philadelphia**—Ordinance introduced for bond issue to complete motorization.

**Pa., Sharon Hill**—Raising funds for purchase of motor fire engine.

**Pa., Summit Hill**—Council has voted to install fire alarm system at cost of \$75,000.

**Tex., San Antonio**—City election July 26 to vote on \$150,000 bonds to install fire alarm system. H. Helland, City Engr.

#### BRIDGES

**Fla., Jacksonville**—Will vote on Aug. 5 on bonds of \$300,000 for viaducts.

**Ga., Greensboro**—Civ. Engr. Mitchem, of Georgia State Hwy. Comm., is completing survey for bridge to be erected over Savannah River at Reid's Ferry in Greene Co.

**Minn., Long Prairie**—Todd Co making plans for Bridge No. 3104, township of Long Prairie, over Turtle Creek, and Bridge No. 3115, Gordon Twp., over outlet to Lake Osakis. E. M. Berg, Co. Aud.

**Mont., Helena**—Bids will be received shortly by State Highway Comm., for 3 bridges; estimates, \$166,000, \$65,000 and \$40,000. Paul D. Pratt, State Highway Engr.

**Neb., Beatrice**—Bids will be received shortly by Co. Comrs. of Gage Co. for 60-ft. steel span bridge, 16-ft. concrete roadway over Indian Creek.

**N. Y., Niagara Falls**—Bd. of Supvrs. voted to appropriate Co.'s share, as well as that of town of Lewiston, for construction of new bridge, with wider roadway, straightening out dangerous approach angles, across the Lewiston branch of the New York Central. It is estimated at \$15,000.

**., Bellaire**—Comrs. of Belmont Co. will erect bridge over McMahon's Creek. B. W. Hopkins, Co. Audr.

**O., Canton**—Plans for proposed viaduct at Charles and Main Sts. will be presented to Viaduct Committee of Council together with estimates of cost of construction.

**O., Elyria**—Plans will be prepared by F. P. Crosse for bridge; estimate, \$40,000. Address Clk. of Lorain Co.

**O., Willoughby**—Lake Co. voters have approved the \$300,000 bond issue to build high level concrete bridge over Chagrin River. It will be 1,065 ft. long, 30-ft. roadway, and will be designed by the Wilbur J. Watson Co., Hippodrome Bldg., Cleveland.

**Pa., Greenville**—Co. Comrs. have voted to construct new bridge over Little Shemango at North Race St. A girder bridge encased in concrete or concrete arch is proposed.

**Pa., Philadelphia**—Governor Sproul signed the Delaware bridge bill, appropriating \$750,000 for preliminary work on the Philadelphia-Camden bridge for next two years.

**Pa., Wilkes-Barre**—Bridge; \$750,000. Archts., Carrere & Hastings, 52 Vanderbilt Ave., N. Y. City. Engr., B. N. Davis, 17 Battery Pl., N. Y. City. Owner, Luzerne Co. Comrs. Drawing plans.

**S. D., Yankton**—City contemplating construction combination bridge across Missouri River. Campaign made for \$200,000. Meridian Hwy. Assn.

**Va., Rectortown**—Comrs. Fauquier Co. soon receive bids building 60-ft. cement concrete bridge over Goose Creek. Address D. D. Crenshaw.

**Wash., Pasco**—Bill authorizing construction of bridge across Snake River, between Pasco and Burbuck, has passed both houses.

**Wash., Spokane**—City having plans prepared for 180-ft. concrete bridge over Hangman Creek, 35 ft. wide, with 5-6 ft. sidewalks. About \$24,000. A. D. Butler, City Engr.

**Wis., Beloit**—Election planned on \$80,000 bonds for bridge over Rock River. Address City Clk.

**Wis., Beloit**—Carried at election \$80,000 bridge bonds.

**Wis., Milwaukee**—Council Committee on Railroads and Bridges decided to recommend that work on construction of new bridge at North Ave. be started immediately. The project has been held up for many months on account of failure to collect \$75,000 from Milwaukee Rd. for its share of cost.

**Wis., Milwaukee**—Plans for new State St. Bridge have been forwarded to War Dept. for approval. Plans and specifica-

tions for new North Ave. bridge have been completed.

**Ont., Parry Sound**—Town Council soon lets contract building cascade bridge to have two steel spans, concrete abutments and center pier. About \$15,000.

**Ont., Ottawa**—The proposed new Cummings Bridge will cost about \$200,000.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**\*Ind., Indianapolis**—Contract for construction of uncompleted part of Main St. bridge over White Water, Richmond, Ind., has been let at \$104,000 to Isaac E. Smith, Richmond, Ind.

**\*Ia., Davenport**—Contractor T. J. McCarthy captured contract for four new concrete bridges. The contract represents a total of \$12,299. Three of the structures are located in Sections 21 and 27 of Butler Twp. and one in Section 8 of Davenport Twp.

#### MISCELLANEOUS

**Cal., Colusa**—Citizens of Colusa are voting on proposition of issuing \$20,000 bonds to finance construction of municipal baths and swimming tank.

**Ia., Waverly**—State Park Comm. inspected the tract at south end of the Harmon St. bridge which is proposed as a state park. The land was judged as especially appropriate for the purpose.

**Minn., Biwabik**—Contemplate election for 1-sty. auditorium and swimming pool. \$200,000. J. F. Goldthorpe, City Clk.

**Mo., Boonville**—Special election July 28, to vote on bond issue of \$14,000 for parks.

**N. J., Camden**—City Council has been requested to issue \$500,000 wharf improvement bonds.

**N. Y., Albany**—Mayor Watt completed arrangements by which old St. Mary's cemetery, on Washington Ave., will be acquired by city for a park. As soon as the land has been formally acquired by city it is expected that City Engr. Lanagan will prepare plans to improve the park, especially the laying out of walks and driveways.

**N. Y., Brooklyn**—Bids were received at Borough Hall, L. I. City, on three contracts for supplies for Hwy. Bureau. Lowest bids follow: 6,500 cu. yds. of sand, Charles K. Myers Contracting Co., \$13,000; 65,000 hardwood paving blocks, Alcott Paving Corporation, \$4,875; 15,000 hardwood paving blocks, Alcott Paving Corporation, \$1,155.

**N. Y., Buffalo**—The Lake Erie Excursion Co. is planning to spend \$500,000 for making improvements for and at Crystal Beach as follows: Widening and enlarging dock, erection of modern hotel; ridge along shore and to the south of dock will be removed.

**N. Y., Syracuse**—The Bd. of Supvrs. voted to assume 25 per cent. of expense of reconstructing tunnel on Camillus-Marcellus Rd. under the Auburn branch of New York Central Railroad. Tunnel will be straightened and lengthened at total cost of \$88,000.

**Okla., Enid**—City Comrs. propose bond issue amounting to \$165,000 for parks and playgrounds.

**Ore., Astoria**—Bids received by Port of Astoria Comm. for construction of huge pier at Astoria, Ore., were as follows: Foundation Co., \$315,491.50; Porter Bros. Co., \$825,460.62; Pacific Bridge & Bldg. Co., \$931,617.25.

**Pa., Pittsburgh**—Plans are being prepared by A. D. Neeld, Engr., to build Liberty Tunnel through South Hills. Bids will probably be asked in October.

**Tex., San Antonio**—City election July 26 to vote on \$100,000 bonds to build incinerator. H. Helland, city engr.

**Tex., San Antonio**—Channel—City election July 26 to vote on \$200,000 bonds to build river channel. H. Helland, City Engr.

**Wash., Seattle**—City Council will receive bids until Sept. 6, 1919, on bond issue of \$790,000 for street railways.

**Wash., Yakima**—Will vote Aug. 14 on \$250,000 public improvement bonds.

**South Africa**—Tenders for 36 steel barrage gates and accessories are called for by Chief Engr. of Water Bd. of city in South Africa. Plans and specifications have been forwarded to the Bureau. Apply to Bureau of Foreign and Domestic Commerce. Refer to Opportunity 29,922.

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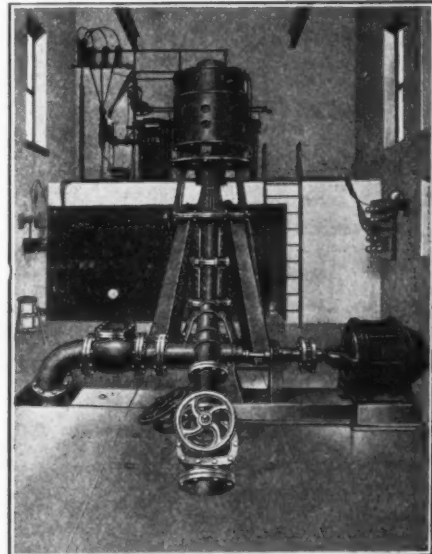
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## TOO LATE FOR CLASSIFICATION

## BIDS ASKED FOR

## STREETS AND ROADS.

**Ala., Birmingham.** 11 a.m., Aug. 4. Thirty-three mi. grading, three mi. macadamizing, four mi. crushed rock, four mi. cinders, resurfacing and paving streets and building bridge.—S. R. Batson, Co. Hwy. Engr., 417 Jefferson Co. Bank Bldg.

**Idaho, Montpelier.** 2 p.m., July 22. National forest road in Bear Lake Co., 11.6 mi. in length, involving clearing and grubbing, 29,145 cu. yd. earth excavation, 1,398 lin. ft. corrugated metal pipe, etc.—U. S. Dept. Agriculture, 405 Col. Hudson Bldg., Ogden, Utah.

**Ind., Greensburg.** 1 p.m., Aug. 4. 10,380 ft. road on line between Washington and Clay Twps.—J. C. Barbe, Co. Aud.

**Ind., Shoals.** noon, Aug. 4. Road in Rutherford Twp.—L. D. Haga, Co. Aud.

**Ind., Fowler.** 1.30 p.m., Aug. 4. Tarvia road in Union Twp.—W. Mankey, Co. Aud.

**Ind., Portland.** 10 a.m., Aug. 4. Gravel or macadamized roads in Knox and Madison Twps.—J. Bonifas, Co. Aud.

**Ind., Valparaiso.** 2 p.m., Aug. 5. One-half mi. gravel road in Pine Twp. and 1½ mi. gravel road in Center Twp.—B. H. Kinne, Co. Aud.

**Ind., Rockville.** 1 p.m., Aug. 5. 14,450 ft. gravel roads in Greene Twp.—R. E. Porter, Co. Aud.

**Ind., Bluffton.** 2 p.m., Aug. 5. 1,843 ft. gravel road in Chester Twp., 31,615 ft. stone roads in Jefferson Twp., 10,594 ft. stone road in Union Twp., 6,651 ft. stone road in Rock Creek Twp., 1,219 ft. concrete street in town of Uniondale and 10,210 ft. stone road in Harrison Twp.—C. T. Kain, Co. Aud.

**Ind., Bedford.** 1 p.m., Aug. 5. Nine gravel or macadamized roads in Guthrie, Shawswick and Marion Twps.—Wm. M. Denniston, Co. Aud.

**Ind., Lebanon.** 10 a.m., Aug. 5. Concrete road in Eagle Twp.—C. Goodwin, Co. Aud.

**Ind., Plymouth.** 1.30 p.m., Aug. 5. Improving two uncompleted roads in Center and German Twps., gravel road in Bourbon Twp.—O. H. Weber, Co. Aud.

**Ind., Shelbyville.** 10 a.m., Aug. 13. Stone road on Co. line between Decatur and Shelby Cos.—F. M. Fagel, Co. Aud.

**Ia., Sigourney.** 2 p.m., July 24. Roads, involving 118,341 cu. yd. excavation and 12½ mi. grading.—Keokuk Co. Aud.

## STREETS AND ROADS.

**Ala., Sheffield.**—An issue of paving and sewer bonds to amount of \$250,000 has been disposed of.

**Ark., Sheridan (Grant Co.).**—M. W. Elkins, of Sheridan, has been awarded issue of Co. road bonds to amount of \$500,000.

**Cal., Lakeport.**—Bids have been opened by California State Hwy. Comn. for construction of two sections of the Lakeport lateral between Hopland and Lakeport. The work involves heavy cuts and fills, more than 200,000 cu. yds. of excavation being necessary. Many of the existent culverts will have to be replaced and ten mi. of property fences will have to be moved.

**Cal., Marysville.**—Because property owners along the line of proposed street improvement prefer that work be done along more lasting lines, though cost will be greater, City Council rejected bids received on Dist. 7, and reordered advertisement for new bids. The streets included in Dist. 7 are: D St., from 5th to Ninth; 5th St., from B to D, and 6th St., from A to C.

**Cal., Oroville.**—City Bd. of Trustees formally adopted street paving program for 1919 and 1920. It was decided that all principal streets of city should be paved immediately. A number of streets

**Ia., Mount Ayr.** 1.30 p.m., July 23. Road work in Ringgold Co.—Co. Aud.

**Ia., Leon.** 2 p.m., July 22. 9.83 mi. grading and 137,572 cu. yd. earth excavation in Decatur Co.—Co. Aud.

**Mich., Lansing.** 1.30 p.m., July 22. State trunk line road in Mackinac Co. and Eaton Co.—F. Rogers, State Hwy. Dept.

**Neb., Nebraska City.** 2 p.m., July 21. 31,000 sq. yd. pavement.—C. A. Shannon, City Engr.

**N. J., Trenton.** 10.30 a.m., Aug. 6. 2,090 sq. yd. concrete surface road in Monmouth Co.—A. L. Grover, Chief Clk., State Hwy. Comn., Broad St Bank Bldg.

**N. Y., Buffalo.** 11 a.m., July 22. Constructing road.—Co. Engr., 575 Ellicott Sq.

**N. Y., New York.** 10.30 a.m., July 26. 150,000 gal. tar road oil; 3,000 bags Portland cement, 5,000 cu. yd. 1½-in. broken trap rock stone and 2,500 cu. yd. broken trap rock stone screenings.—H. Bruckner, Pres., Boro. of Bronx.

**Pa., Harrisburg.** 10 a.m., Aug. 5. Reconstructing pavements, involving 6,788 lin. ft. reinforced concrete in Beaver Co.; 2,414 lin. ft. reinforced concrete in Bedford Co.; 6,634 lin. ft. reinforced concrete and hillside vitrified brick in Cambria Co.; 12,355 lin. ft. reinforced concrete or bituminous surface course on concrete foundation in Centre Co.; 43,455 lin. ft. reinforced concrete and hillside vitrified brick in Clearfield Co.; 41,753 lin. ft. reinforced concrete or bituminous surface course on concrete foundation in Dauphin and Perry Cos.; 18,940 lin. ft. bituminous surface course on concrete foundation or reinforced concrete in Erie Co.; 5,950 lin. ft. reinforced concrete and hillside vitrified brick in Fayette Co.; 12,000 lin. ft. reinforced concrete in Indiana Co.; 25,737 lin. ft. reinforced concrete or bituminous surface course on concrete foundation in Juniata and Snyder Cos.; 7,538 lin. ft. bituminous surface course on concrete foundation in Lackawanna Co.; 38,510 lin. ft. bituminous surface course on concrete foundation or reinforced concrete in Lycoming Co.; 29,182 lin. ft. reinforced concrete in Northampton Co.; 22,435 lin. ft. reinforced concrete in Schuylkill Co.; 14,000 lin. ft. reinforced concrete in Venango Co. and 32,047 lin. ft. reinforced concrete and hillside vitrified brick in Westmoreland Co.—L. S. Sadler, State Hwy. Comr.

**Tex., McKinley.** 6 p.m., July 24. Paving three mi. streets, involving 35,000 sq. yd.—City Engr.

**W. Va., Mount Pleasant.** July 25. Sewer in various streets.—M. G. Hall, Engr., Centerville.

## SEWERAGE.

not having sidewalks were also ordered fixed. City Engr., S. J. Norris.

**Col., Colorado Springs.**—Four mi. of concrete walks are to be laid on 24 streets here.

**Col., Denver.**—Work will start for shortening and more direct route from Denver to Yellowstone National Park. \$250,000 will be spent on 60 mi., which will automatically throw open for travel 150 mi. of highway.

**Ga., Savannah.**—Citizens voted \$2,500,000 for permanent roads as follows: Port Wentworth Rd., Louisville, Ogeechee Rd., Dale Ave., Tybee Ave. and Lathrop Rds.

**Ga., Waycross.**—Ware Co. voted issuance of bonds to amount of \$630,000 for road paving and \$70,000 for building and equipping public school buildings.

**Ga., Quitman.**—Brooks Co. voted for issuance of \$500,000 to be used for permanent paved roads.

**Ida., Idaho Co.**—Messrs. Keeler Bros., of Denver, have been awarded issue of 6 per cent highway construction bonds to amount of \$25,000.

**Ill., Carlinville.**—City Council proposes to improve Plum St. by paving. The total estimated cost of improvement is \$35,548.20.

**La., New Orleans.**—The Police Jury of West Carroll Parish applied to Louisiana State Hwy. Dept. for permission to build

**N. J., Westmont.** 8 p.m., July 22. Sewers and sewage disposal plant to cost \$125,000.—Remington & Vosbury, Engrs., 6th and Market Sts., Camden.

## WATER SUPPLY.

**Mass., Boston.** noon, July 21. Seven-ft. diameter reinforced concrete by-pass and stop plank chamber at pumping station in Dorchester.—T. F. Sullivan, Comr. Pub. Wks., 508 City Hall Annex.

**Minn., Chaska.** 8 p.m., Aug. 4. Installing 400 ft. 6-in., 1,600 ft. 4-in. pipe, six 4-in. hydrants and twelve 4-in. gates.—J. M. Aretz, City Clk.

**Minn., New Prague.** 6 p.m., Aug. 11. 60,000 gal. capacity wooden water tank.—J. F. Bruzek, City Clk.

**Minn., Farmington.** 8 p.m., July 29. 4,800 lin. ft. 6-in. water main with valves, hydrants and accessories.—Druar & Smith, Engrs., Globe Bldg., St. Paul.

**N. Y., Fulton.** 8 p.m., July 21. Furnishing 649 tons 16-in. and 95 tons 12-in. class D pipe.—J. Frawley, Pres., Bd. Pub. Wks.

**O., Garfield Heights.** noon, July 21. Extending water mains.—H. Bohning, Vil. Clk.

## FIRE EQUIPMENT.

**Ill., Mendota.** 8 p.m., July 21. One triple-combination chemical engine, hose and motor car, pumping capacity 350 gal. per minute, with all necessary appurtenances.—C. Weidner, City Clk.

**R. I., Woonsocket.** 8 p.m., July 22. 1,000 ft. 2½-in. fire hose.—G. E. Reilly, City Aud.

## BRIDGES.

**Ind., Rochester.** 2 p.m., July 28. Constructing bridge and repairing bridge.—E. A. Smith, Co. Aud.

**Ind., Richmond.** 11 a.m., July 26. Culvert in Center Twp. and culvert on line between Harrison and Jefferson Twps.—H. Brooks, Co. Aud.

**Ind., Evansville.** 10 a.m., July 28. Reinforced concrete bridge.—Ed. Co. Comrs.

**Mass., Boston.** noon, July 21. Rebuilding floor of Neptune road bridge.—T. F. Sullivan, Comr. Pub. Wks., 508 City Hall Annex.

**Mich., Lansing.** 1.30 p.m., July 23. Trunk line bridge in Ignace Twp.; bridges across Baltimore River in Stannard Twp.; three bridges in Ottawa Co.—F. F. Rogers, State Hwy. Comr.

**O., Painesville.** July 28. Repairing west abutment of bridge in Kirkland Twp.; also culvert in Perry Twp.—W. A. Davis, Co. Aud.

40 mi. of new road extending from Macon Ridge to Arkansas state line. Over \$300,000 worth of bonds bearing 5 per cent interest have been sold in West Carroll Parish for the construction of highways, and a small tax will be levied for their upkeep each year.

**La., Oberlin.**—The election held in Ward Two June 25 resulted in favor of issuing road bonds to the amount of \$200,000.

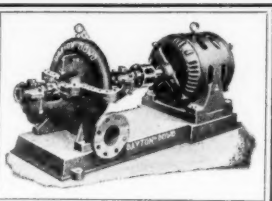
**Neb., Scottsbluff.**—City voted bond issue of \$29,000 for paving.

**N. Y., Rochester.**—New roads to cost \$408,500 were provided for Monroe Co. in resolutions passed recently.

**N. C., Asheville.**—James G. Stikeleather, member of State Hwy. Comn., reports that plans for the Asheville-Black Mountain Hwy., from Azalea to Black Mountain, have been officially approved by Federal authorities, and it is expected that bids will be advertised for immediately. Road to be paved is seven and seven-tenths mi. long. Three types of road will be considered—concrete, macadam with tarvia top and bitulithic. Road will cost, according to type to be used, between \$200,000 and \$300,000, and will be built during the summer or fall.

**N. C., Shelby.**—J. J. Lattimore, Clk. of Comrs. of Cleveland Co., will receive

(Continued on page 32)



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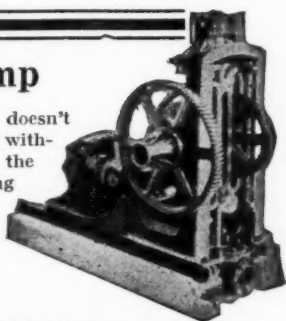
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NO TROUBLE**

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INDIANAPOLIS INDIANA

# OFFICIAL ADVERTISING

Pennsylvania State Highway Department, Harrisburg, Pa.—Sealed proposals will be received at the State Capitol until 10:00 A. M., July 29, 1919, when bids will be publicly opened and scheduled, and contracts awarded as soon thereafter as possible for the reconstruction of the following pavements: 36,979 linear feet of Reinforced Concrete and Hillside Vitri-fied Brick in Adams County; 14,481 feet of Reinforced Concrete in Beaver County; 15,207 feet of Vitri-fied Brick on a Concrete Foundation and Bituminous Surface Course on a Concrete Foundation in Bradford County; 32,128 feet of Bituminous Macadam Surface Course (Penetration Method) on a Telford Foundation in Chester County; 46,815 feet of Resurfacing with Bituminous Mixtures on a prepared Broken Stone Base in Chester and Delaware Counties; 18,619 feet of either One Course Reinforced Concrete and Hillside Vitri-fied Brick or Two Course Reinforced Concrete and Hillside Vitri-fied Brick in Crawford County; 18,640 feet of One Course Reinforced Concrete and Hillside Vitri-fied Brick in Crawford County; 49,420 feet of either Bituminous Surface Course on a Concrete Foundation and Hillside Vitri-fied Brick or Reinforced Concrete and Hillside Vitri-fied Brick in Erie County; 19,918 feet of Vitri-fied Brick on a Concrete Foundation in Fayette County; 25,972 feet of Reinforced Concrete and Hillside Vitri-fied Brick in Jefferson County; 29,628 feet of either Reinforced Concrete and Hillside Vitri-fied Brick or Two Course Reinforced Concrete and Hillside Vitri-fied Brick in Lawrence County; 24,049 feet of either Bituminous Surface Course on a Concrete Foundation and Hillside Vitri-fied Brick or Reinforced Concrete and Hillside Vitri-fied Brick in Mifflin County; 43,298 feet of either Bituminous Surface Course on a Concrete Foundation and Hillside Vitri-fied Brick or Reinforced Concrete and Hillside Vitri-fied Brick in Montgomery County; 15,898 feet of either Bituminous Surface Course on a Concrete Foundation or Reinforced Concrete in Montgomery and Bucks Counties; 25,655 feet of resurfacing with Bituminous Mixtures on a prepared Broken Stone Base in Northampton County; 53,806 feet of either Bituminous Surface Course on a Concrete Foundation or Reinforced Concrete in Susquehanna County; 11,484 feet of Reinforced Concrete in Union County; 9,480 feet of Reinforced Concrete and Hillside Vitri-fied Brick in Washington County; 1,106 feet of Vitri-fied Brick in Washington County; and 19,549 feet of Reinforced Concrete and Hillside Vitri-fied Brick in Westmoreland County. Bidding blanks and specifications may be obtained free, and plans upon payment of \$2.50 per set, on application to State Highway Department, Harrisburg. No refund for plans returned. They can also be seen at office of State Highway Department, Harrisburg; 1001 Chestnut Street, Philadelphia, and 904 Hartje Building, Pittsburgh, Pa. Bids will also be received at the same time and place for the construction of the following Bridges: Wyoming County, Route No. 9, Nicholson Township and Nicholson Borough, triple span, 135 feet c. to c. end pins, 26 feet c. to c. of trusses, having a reinforced concrete floor system; also York County, Route No. 127, York Township, one through truss, 144 feet c. to c. end pins, 25 feet 10 inches c. to c. trusses. Specifications will be furnished free upon request, and plans upon payment of \$2.50 per set. LEWIS S. SADLER, State Highway Commissioner.

Bids received until July 28, 1919.

## NOTICE TO CONTRACTORS Building of Vitri-fied Pipe Sewers NEW BETHLEHEM, PA.

Notice is hereby given that sealed proposals will be received by the Town Council of the Borough of New Bethlehem, Pa., at the Council Chamber in the Municipal Building in New Bethlehem, Pa., until 8:00 o'clock P. M. on Monday, the 28th day of July, 1919, for the construction, complete, of

VITRIFIED PIPE SANITARY SEWERS, consisting of main intercepting sewer and of various lateral sewers, of sizes from 18 inches to 8 inches, with the necessary man-holes, etc.

Proposals will be required to conform to the plans and specifications on file at the office of D. M. Geist, Secretary of Council, New Bethlehem, Pa., and at the offices of E. W. Hess, Engineer, at DuBois, Pa., and at Clearfield, Pa., and must be made upon the "Bidding Sheet" that will be furnished to bidders on request.

Each bidder must deposit with his bid cash or certified check, made payable to the Council of New Bethlehem Borough, in an amount equal to fifty dollars (\$50) for each section of sewer bid upon as a guarantee of good faith that he will, if a contract is awarded to him, within ten (10) days thereafter execute a written contract for the performance of the same. The deposits of other bidders will be returned to them.

A bond satisfactory to the Council, in an amount equal to the contract awarded, for the faithful performance of the contract, will be required of the bidder to whom a contract is awarded.

Bids must be sealed and addressed plainly to "The Town Council of the Borough of New Bethlehem" and marked on the outside of the envelope enclosing them: "Proposal for Construction of Vitri-fied Pipe Sanitary Sewers."

The right is reserved to accept any or to reject any or all bids.

THE TOWN COUNCIL OF  
NEW BETHLEHEM BOROUGH.

Bids received until August 5, 1919.

## Notice to Paving Contractors SHARPSVILLE, PA.

July 7, 1919.

Sealed proposals will be received by the Secretary of the Borough of Sharpsville, Pa., until 5:00 o'clock P. M., August 5, 1919 (Tuesday), for the paving of Walnut Street from Mercer Avenue to the westerly line of Covert Avenue, with brick blocks or other materials as may be selected by the Borough Council; approximately forty-two hundred (4,200) square yards.

Also for the paving of Walnut Street from the tracks of the Sharpsville Railroad northward to the northerly curb line of Shenango Street, with brick blocks or other materials as may be selected by the Borough Council; approximately eight hundred (800) square yards.

Specifications and bidding sheets may be had at the office of the Secretary, or the Borough Engineer.

The Borough Council reserves the right to reject any or all bids.

WILLIAM A. GRABER,  
Secretary Borough of Sharpsville.

Bids received until July 22, 1919.

## Highway Work

Office of the State Commission of Highways  
ALBANY, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1:00 o'clock P. M. on Tuesday, July 22, 1919, for the improvement of the following highways:

CATTARAUGUS—One highway—4.60.  
CHAUTAUQUA—One highway—4.29.  
CHENANGO—Three highways—4.78, 5.57 and 5.87.  
LEWIS—One highway—4.74.  
ONONDAGA—One highway—0.27.  
RENSSELAER—One highway—1.44.  
SUFFOLK—One highway—3.85.

Also for the Completion of the Following  
Highways:

CAYUGA—Three highways—8.00, 6.06 and 5.45.  
CHAUTAUQUA—One highway—3.90.  
CHENANGO—Three highways—7.12, 7.09 and 3.06.  
FRANKLIN—One highway—10.36.  
NIAGARA—One highway—7.79.  
OSWEGO—One highway—6.36.  
SARATOGA—Two highways—6.10 and 5.74.  
SENECA—Two highways—4.89 and 2.13.

And also for the Repair of the Following  
Highways:

ALLEGANY, SCHUYLER and STEUBEN—One contract—surface treatment.  
OSWEGO—One contract—resurfacing.  
SUFFOLK—One contract—reconstruction.

And also for the Completion of: (Repair  
Contracts)

CHENANGO—One contract—resurfacing.  
CORTLAND—One contract—resurfacing.

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of the division engineers in whose division the roads to be improved, completed and repaired are located. The addresses of the division engineers and the counties of which they are in charge will be furnished upon request.

The especial attention of bidders is called to "General Information for Bidders" on the itemized proposal, specifications and contract agreement.

FREDERICK STUART GREENE,  
Commissioner.

ROYAL K. FULLER, Secretary.

Bids received until July 29, 1919.

## Highway Work

Office of the State Commission of Highways  
ALBANY, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1:00 o'clock P. M. on Tuesday, July 29, 1919, for the improvement of the following highways:

CHAUTAUQUA—One highway—4.64.  
JEFFERSON—One highway—6.78.  
And also for the Completion of the Following  
Highways:

ALLEGANY—One highway—9.07.  
CATTARAUGUS—One highway—6.98.  
CAYUGA—Two highways—3.89 and 4.39.  
DUTCHESS—Two highways—6.97 and 6.79.  
FRANKLIN—One highway—1.99.  
JEFFERSON—Three highways—4.05, 14.05 and 7.76.  
LIVINGSTON—One highway—7.69.  
MONROE—Five highways—2.92, 7.93, 5.27, 6.33 and 4.55.

# EQUIPMENT BARGAINS

## ROAD ROLLERS—STEAM

ALL 10 TON, 3 WHEEL

- 1 Kelly-Springfield—single cyl... \$1250  
 1 Rogers—single cyl..... 1100  
 1 Buffalo-Pitts—double cyl..... 1600

## CONCRETE MIXERS

## MARION SHOVEL

2½ yd. Bucket—8 wheel—A1... \$3500

## DUMP CARS

14—6 yd. stan. gauge, steel, A1, \$300 ea.

## POST AND POLE HOLE DIGGER

Will dig hole 2 feet dia. by 7 feet deep in  
 3 minutes—3 men..... \$4000

## PORTABLE BOILERS

40 HP., 50 HP., 60 HP., 80 HP., 200 HP.

## DERRICKS

All Kinds

## SAND PUMPS 10" & 12" Belt

## GENERATORS—MOTORS—HOISTING ENGINES

FOR SALE, CASH, TIME OR TO RENT

## SEYMOUR ENGINEERING CO.

1627 MARQUETTE BLDG., CHICAGO

ONEIDA—One highway—5.34.  
 ONONDAGA—One highway—3.06.  
 ORANGE—One highway—4.03.  
 SCHUYLER—One highway—6.03.  
 WAYNE—One highway—2.25.

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of the division engineers in whose division the roads to be improved, completed and repaired are located. The addresses of the division engineers and the counties of which they are in charge will be furnished upon request.

The especial attention of bidders is called to "General Information for Bidders" on the itemized proposal, specifications and contract agreement.

FREDERICK STUART GREENE,  
 Commissioner.

ROYAL K. FULLER, Secretary.

Bids received until August 5, 1919.

### Highway Work

Office of the State Commission of Highways  
 ALBANY, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1:00 o'clock P. M. on Tuesday, August 5, 1919, for the improvement of the following highway:

WARREN—One highway—4.59.

And also for the Completion of the Following Highways:

BROOME—Two highways—6.93 and 4.70.

FRANKLIN—One highway—11.41.

GENESEE—Two highways—2.62 and 7.94.  
 RENSSELAER—Two highways—7.20 and 2.97.

ST. LAWRENCE—Two highways—11.16 and 4.60.

WARREN—One highway—5.13.  
 WYOMING—One highway—4.73.

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of the division engineers in whose divisions the roads to be improved and completed are located. The addresses of the division engineers and the counties of which they are in charge will be furnished upon request.

The especial attention of bidders is called to "General Information for Bidders" on the itemized proposal, specifications and contract agreement.

FREDERICK STUART GREENE,  
 Commissioner.

ROYAL K. FULLER, Secretary.

Bids received until July 30, 1919.

### Notice to Contractors

(Re-advertisement of the Work)

GALLITZIN, PA.

Sealed proposals for the construction of 6,000 square yards of vitrified brick pavement on a concrete base on Church Street will be received at the office of the Borough Secretary, Gallitzin, Pa., until 8:00 o'clock P. M. of the 30th day of July, 1919.

The work consists approximately of 6,000 square yards of paving, 3,000 cubic yards of

Bulletin No. 250—88 pages—is a

### SURE MONEY SAVER

Get it—before buying

Contractors' Equipment, Cars, Ralls, Mixers, Engines, Piling, Pipe, Bridges, Tanks.

**ZELNICKER IN ST. LOUIS**

excavation and 175 lineal feet of stone protection curb. All labor and all material will be furnished by the contractor.

Proposal sheets may be obtained from the Engineer and the plans and specifications may be seen at his office.

A set of the plans and a copy of the specifications may be obtained by depositing eight dollars (\$8.00) with the Engineer. This deposit will be refunded upon the return of the plans and specifications in good condition.

Each bid must be accompanied by a certified check of one thousand dollars (\$1,000.00) as a guarantee of the good faith of the bidder.

Bidders are requested to make appointments with the Engineer to go over the proposed improvement and to examine the plans and specifications.

The Council of the Borough of Gallitzin reserves the right to reject any or all bids.

HARRY F. CONRAD, Borough Secretary,  
 708 Hemlock Street, Gallitzin, Pa.  
 D. W. DILLMAN, Borough Engineer,  
 80-81 Altoona Trust Building, Altoona, Pa.

## OFFICIAL ADVERTISING

Pennsylvania State Highway Department, Harrisburg, Pa.—Sealed proposals will be received at the State Capitol until 10:00 A. M., August 5, 1919, when bids will be publicly opened and scheduled and contracts awarded as soon thereafter as possible for the reconstruction of the following pavements: 6,788 linear feet of Reinforced Concrete in Beaver County; 2,414 linear feet of Reinforced Concrete in Bedford County; 6,634 linear feet of Reinforced Concrete and Hillside Vitri-fied Brick in Cambria County; 12,355 linear feet of either Reinforced Concrete or Bituminous Surface Course on a Concrete Foundation in Centre County; 43,455 linear feet of Reinforced Concrete and Hillside Vitri-fied Brick in Clearfield County; 41,753 linear feet of either Reinforced Concrete or Bituminous Surface Course on a Concrete Foundation in Dauphin and Perry Counties; 18,940 linear feet of either Bituminous Surface Course on a Concrete Foundation or Reinforced Concrete in Erie County; 5,950 linear feet of Reinforced Concrete and Hillside Vitri-fied Brick in Fayette County; 12,000 linear feet of Reinforced Concrete in Indiana County; 25,737 linear feet of either Reinforced Concrete or Bituminous Surface Course on a Concrete Foundation in Juniata and Snyder Counties; 7,538 linear feet of Bituminous Surface Course on a Concrete Foundation in Lackawanna County; 38,510 linear feet of either Bituminous Surface Course on a Concrete Foundation or Reinforced Concrete in Lycoming County; 29,182 linear feet of Reinforced Concrete in Northampton County; 22,435 linear feet of Reinforced Concrete in Schuylkill County; 14,000 linear feet of Reinforced Concrete in Venango County, and 32,047 linear feet of Reinforced Concrete and Hillside Vitri-fied Brick in Westmoreland County. Bidding

### STREETS AND ROADS.

(Continued from page 28.)

sealed bids until July 21 for 6 per cent. semi-annual road bonds, \$250,000.

**O., Warren (Trumbull Co.)**—Messrs. Stacy & Braun, of Toledo, were successful bidders for the 5 per cent 4½-yr. road bonds to amount of \$49,000.

**Ore., Albany**—Portions of four Albany streets will be paved this summer—6th, Elm and 1st Sts., on Salem Rd.

**S. D., Mitchell**—Preliminary plans made for paving five mi. of city streets. Work will begin next spring as soon as weather conditions permit.

**Tex., Fort Worth**—Ordinances were passed by the City Comm. ordering pavement on two streets. Streets involved are Jefferson and Richmond, from New York Ave. to Mississippi.

**Tex., Groesbeck**—Atty.-Gen.'s Dept. approved following bond issues: Limestone Co. Rd. Dist. No. 14, \$250,000, and Rd. Dist. No. 15, \$300,000; both issues payable serially and bearing 5½ per cent.

**Tex., Little Rock**—Randolph Co. is planning to expend half a million dollars on construction of system of improved roads. The Western Randolph Rd. Impvt. Dist. provides for a system of six highways, radiating from Pochontas. Survey and preliminary work are well advanced, according to Lund & Hill, Engrs. in charge. Native stone and gravel are being used, and for much of the mileage it is only necessary to grade up the road bed.

**Va., Bristol**—Action on petition presented by property holders on Portsmouth Ave. was taken. Request that street be macadamized north of Mary St. to corporate limits was granted. An ordinance was passed opening Euclid Ave. across the Virginia and Southwest-ern Railway west of Commonwealth Ave. New street to be 90 ft. wide. Street Committee was instructed to ac-

quire right of way over the railroad at that point.

**Ont., Iroquois Falls**—\$20,600 will be expended this year by Town Council for construction of concrete curbs. Tarvia macadam pavements will be constructed on several streets. Estimated cost, \$35,640. Town Council plans to construct sidewalks at cost of \$6,000. Town Council will expend \$7,200 this year for grading blocks "A" and "B," and for constructing triangular parking spaces at various street intersections. A. J. Hodgson, Clk.

**Ont., Toronto**—Asphalt pavements will be constructed by City Council on Annette St., Chestnut Park Ave., Kenilworth Ave., and brick block pavements on Cypress St., and granite block pavements on Eastern Ave. Estimated cost, \$178,870. W. A. Littlejohn, City Clk. City Council contemplates construction of the following: 16,000 ft. boulevard drive curb, 14,000 ft. traffic road curb, 90,000 sq. ft. concrete walk, 182,400 sq. ft. board walk, 13,510 ft. of storm water drainage, 75,000 sq. yds. grading and sodding, 41,970 sq. yds. concrete boulevard drive pavement. Total cost, \$384,721.

Bids received until August 5, 1919

### Macadam Pavement

VINITA, OKLA.

The City of Vinita, Oklahoma, is asking for sealed bids for ten (10) blocks of Macadam Pavement. Bids to be opened August 5, 1919. EDGAR BAKER, City Clerk.

**TREASURY DEPARTMENT**, Supervising Architect's Office, Washington, D. C., July 16, 1919.—Sealed proposals will be opened in this office at 3:00 P. M., August 4, 1919, for a portable plain grate, firebox heating boiler, etc., in the United States Post Office, New Brunswick, N. J., in accordance with specification and drawing, copies of which may be had at this office or at the office of the Custodian, New Brunswick, N. J., in the discretion of the Supervising Architect. JAS. A. WETMORE, Acting Supervising Architect.

**TREASURY DEPARTMENT**, Supervising Architect's Office, Washington, D. C., July 17, 1919.—Sealed proposals will be opened in this office at 3:00 P. M., July 28, 1919, for repairs to mechanical equipment in the United States Treasury, Winder, Butler and Auditor's Buildings, Washington, D. C., in accordance with specification, copies of which may be had at this office, in the discretion of the Supervising Architect. JAS. A. WETMORE, Acting Supervising Architect.

### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates contracts awarded.)

**Cal., Lakeport**—The lowest bid for grading the 9.4-mi. unit between Lakeport and the westerly boundary of Lake Co. was made by A. J. Fairbanks, it being \$141,710, as against the Engr.'s estimate of \$98,140. For the 9.7-mi. unit leading to Hopland the lowest bid was \$119,751, made by J. P. Holland, the Engr.'s estimate being \$100,349.

**Ind., Sullivan**—Sullivan Co. Comrs. have let the following contracts: Concrete road in Hamilton Twp., 4,327 ft., to Keer, Murphey & Dodson, Bloomington, Ind., at \$27,451.37; gravel road in Had-

don Twp., 12,580 ft., to George Lovelace, Shelburn, Ind., at \$19,691; macadam road in Gill Twp., 10,550 ft., to Joe R. Louder-milk, Sullivan, Ind., at \$17,500; gravel road in Turman Twp., 11,200 ft., to Daugherty & Wible, Farmersburg, Ind., at \$16,900; concrete road in Hamilton Twp., 4,587 ft., to Keer, Murphey & Dodson, Bloomington, Ind., at \$32,307.07; macadam road in Jefferson Twp., 2,070 ft., to C. H. Ridgeway, Carlisle, Ind., at \$6,500.

**Ind., Valparaiso**—Auditor of Porter Co. announces the letting of construction of gravel road known as the Fred Hess Rd. in Union Twp. to John McGillyuddy, Valparaiso, Ind., at \$22,000.

**Va., Bristol**—Contract for paving Spencer St. was awarded to Municipal Paving and Construction Co. at meeting of City Council.

**Wash., Olympia**—Bids were opened and contracts let by State Hwy. Comm. for following improvements: Seven mi. of paving on Pacific Hwy., between Toledo and Forrest, in Lewis Co. Bids follow: C. M. Morgan, Auburn, \$221,693; F. A. Ferguson, Seattle, \$229,050; Puget Sound B. & D. Co., Seattle, \$229,624; Kaiser Paving Co., Seattle, \$224,855; G. F. Atkinson, Portland, \$256,040. Contract was let to Morgan. Sunset Hwy., from Spokane west, four mi. of paving. Contract let to Standard Asphalt Paving Co., of Spokane, on bid of \$131,358. Al-bertson, Cornell & Simpson, of Tacoma, will pave seven mi. of Pacific Hwy., from Olympia south. Bid of this firm was \$189,200.29. Engineer's estimate, \$186,941. J. W. Hoover Co., of Everett, will pave one-half mi. of Pacific Hwy. east of Everett, at cost of \$32,203.72. Engineer's estimate, \$33,978. D. A. Williams, of Tacoma, will surface 5½-in. of Pacific Hwy., from Woodland, in Cowlitz Co., on bid of \$34,038. Clifton, Applegate & Toole, of Spokane, will surface four mi. of Sunset Hwy. east of Spokane. This contract amounts to \$166,894.80, the Engr.'s estimate, \$98,866. Robert A. Sloane, Seattle, will grade and gravel the Chelan and Okanogan Hwy., from Brewster to Malatt, on contract amounting to \$56,654.50. The second strip of this highway from Tomasket to Oroville will be constructed by Anderson & McDowell, of Molson, at a cost of \$51,324.75. That portion of Sunset Hwy. from Hart-line east to Lincoln Co. line will be graded and graveled by A. A. Prouex, of Almira, at cost of \$41,134.

### SEWERAGE.

**Ala., Sheffield**—See "Streets and Roads."

**Cal., Willows**—Bond issue of \$40,000 for sewer system has been ratified.

**Ga., Cartersville**—Sewer bonds to amount of \$90,000, recently voted, have been sold.

**Neb., Scottsbluff**—City has voted sewer bonds of \$40,000.

**N. J., Newark**—Citizens voted \$90,000 in bonds for new sewage disposal plant at Overbrook.

**N. J., Trenton**—Work will start shortly for the installation of a sewage disposal plant, including installation of Imhoff tanks and sterilization plant. Approximate cost, \$500,000.

**Okla., Broken Bow**—City will vote July 15 on bond issue of \$40,000 for sewers.

**Tex., Laredo**—City will issue bonds of \$125,000 for sewers.

### WATER SUPPLY.

**Ga., Milledgeville**—Mayor M. S. Bell will receive sealed bids until July 30 for the 5 per cent annual bonds, \$93,000, for water supply.

**Neb., Falls City**—The election held July 1 resulted in favor of issuing water works bonds to amount of \$50,000.

**Neb., Scottsbluff**—City voted bonds of \$30,000 for water extension.

**N. J., South Amboy**—An ordinance is before City Council providing for issuance of 5 per cent semi-annual water works bonds to amount of \$225,000.

**Okla., Broken Bow**—Election will be held July 15 to vote on bond issue of \$100,000 for water works.

**Wash., Yakima**—Special election will be held soon to vote on issuance of \$344,300 for extending city sewage system. C. F. Wilson, Engr.

**Ont., Milton**—Construction of water system is contemplated by Town Council.

### FIRE EQUIPMENT.

**Minn., St. Paul**—Important improvements of fire department apparatus under consideration.